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#### KEY TO ABBREVIATIONS

B R —Book Review	Misc —Miscellany
C —Correspondence	N —Notice
E —Editorial	N E S S —New England Surgical Society
M H —Medical History	N E U A —New England Branch of the American Urological Association
M L S —Massachusetts Medical Legal Society	N H M S —New Hampshire Medical Society
M M S —Massachusetts Medical Society	O —Obituary
M P —Medical Progress	Or —Original Article
M N —Meeting Notice	V S M S —Vermont State Medical Society
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## A SOCIAL STUDY OF PATIENTS WITH CHRONIC CARDIAC DISEASE TREATED BY TOTAL THYROIDECTOMY\*

BY ETHEL COHEN M.S.† AND ROSALIND L. HERRMANN‡

### Introduction

THIS paper reports the results of a social study of forty-seven patients† with cardiac disease treated by complete removal of the thyroid gland at the Beth Israel Hospital Boston, Massachusetts. Studies of the medical and surgical aspects of the problem are described in publications of the Medical Research Department. According to these reports "treatment of chronic heart disease by complete removal of the thyroid gland was undertaken in the hope that restitution of certain normal physiological relationships would accomplish clinical improvement. In patients with intractable congestive heart failure, the blood supply is inadequate for the metabolic demands of the tissues. In angina pectoris, the available coronary blood supply is not sufficient for the needs of the heart. By inducing hypothyroidism with its lowered metabolic rate by means of total thyroidectomy, the discrepancy between tissue needs and blood supply is abolished and these two important fundamental factors are brought into proper relationship."‡

The ultimate aim of all therapy is not only to prolong life and reduce to a minimum the disintegrating effects of illness, but to attain for the patient maximum participation in normal social life. In keeping with this general objective, the present study was undertaken to learn what effect this new type of treatment has had upon the lives of the patients to whom it was offered.

Have individuals previously reduced to chronic invalidism by heart disease been enabled by this operation to take up more normal life?

For how long a period and to what extent has such improvement been made possible?

How have patients after total thyroidectomy reacted to the complex stresses and strains of ordinary industrial and family life?

Is there evidence to demonstrate whether pa-

tients have become better adjusted individuals and more productive socially?

### Method of Study

To secure the most accurate information possible, only patients were included in the study who could be interviewed personally and whose statements could be correlated with observations of other individuals in a position to evaluate the situation. Forty-seven patients satisfied these requirements and are included in this study. The postoperative interval varied from twelve to thirty months. The necessary data were collected between November 15, 1934 and July 1, 1935. An additional nine patients who expired before November 1934 were known to the social worker. Their postoperative activity will also be mentioned inasmuch as this information is available in their social service records.

A detailed schedule (Appendix 2) was used as a basis for analysis of each of the forty-seven cases in its various aspects both before and after thyroidectomy. Consideration was given to the subjects of health education, occupation, personality, economic status, general activity, reactions to the illness experience of patient and family, economic significance of the illness to the patient, family and community and evaluation by patient, family and associates, of this operation as treatment for heart disease.

Each patient was interviewed personally by a medical-social worker. She had been in constant touch with thirty-six of the forty-seven patients for many months because of social situations requiring adjustment. The other eleven patients were interviewed only to complete the findings of this study. To secure adequate objective and unbiased information, several members of each family, employers, private physicians, social workers and friends were interviewed. The informants selected were well acquainted with the condition of the patients both before and following thyroidectomy and were capable of noting changes in their activity and in their emotional reactions.

A total of 185 persons was interviewed of whom forty-seven were the patients sixteen wives, thirteen husbands, twenty-eight adult children, eight mothers, two fathers, eight sib-

From the Social Service Department of the Beth Israel Hospital Boston Massachusetts May 1936.  
This study was made possible by a grant from the Committee of the Permanent Charities Inc. of Boston.

†For Case Summaries see Appendix 1.

‡Cohen Ethel — Director Social Service Department Beth Israel Hospital Boston Herrmann Rosalind L. — Medical social worker Beth Israel Hospital Boston For records and addresses of authors see "This Week's Issue" page 45.



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An item even more significant in magnitude and in its implications for society than the actual expenditures for medical care and relief, is the loss of earning power of the incapacitated patients. A calculation of the extent of loss perhaps would have been a contribution to this discussion, but the amount of time involved in securing reliable data seemed unwarranted for the main purposes of this study.

### *Preoperative Medical Condition*

The medical condition of patients prior to total thyroidectomy and the criteria used in selection for operation, have been described as follows:

The course of chronic heart disease is often irregular and characterized by periods of unexpected exacerbation and remission. The fact that recovery from such remissions may be complete for varying periods made it imperative to select only patients in whom the course of the disease had been progressive and who showed evidence of incapacity even during a period of remission. The patients with congestive failure had all been treated by rest in bed for a long period and although they may have been free from symptoms after prolonged rest in bed they regularly showed evidence of congestive failure on getting out of bed. The condition in each case was such that definite improvement could be confidently attributed to the operative procedure.<sup>5\*</sup>

No patient was chosen whose prognosis for life was good. In each instance the operation was offered to the patient with a full account of its experimental status without minimizing the risk of operation. No better gage of the predicament of most of these patients could be found than their pathetic desire to hazard any of the dangers involved in order to secure possible benefit after having suffered for many years and after having observed their condition become progressively worse in spite of medical treatment.<sup>5†</sup>

Many types of cardiovascular disease are represented in this group. The distribution of these conditions among the forty-seven patients is shown in the following table:

TABLE 1  
ETIOLOGY

Primary Symptomatology	Totals	Arterio-sclerotic Heart Disease	Rheumatic Heart Disease	Miscellaneous*
Angina Pectoris	18	18		
Congestive Failure	26	6	18	2
Miscellaneous†	3	2	1	
	47	26	19	2

\*Congenital Heart Disease and Cor Pulmonale

†Paroxysmal Dyspnea, Paroxysmal Auricular Tachycardia and Paroxysmal Auricular Fibrillation

Forty of these patients, prior to total thyroidectomy, had been either completely bedridden or chronic invalids. For the most part they were continuously confined to bed and required nursing care. They were unable to follow the daily routine of the average normal person. This is in agreement with the medical findings, according to which the prognosis for future activity was poor for an indefinite period of time. From the economic point of view, all of these forty patients were totally disabled. Disability was considered to be total when it prevented the patient from engaging in any occupation for remuneration or profit.\*

The duration of their disability prior to total thyroidectomy is tabulated as follows:

TABLE 2

Duration of Disability	Number of Patients
Over 10 years	1
10 years to 5 years	3
5 years to 1 year	25
5 to 4 years	1
4 to 3 years	2
3 to 2 years	8
2 to 1 year	14
Under 1 year and more than 2 months	11
Total	40

The remaining seven patients of the forty-seven were recurrently disabled, that is, they had had recurrent periods during which they were bedridden for less than two consecutive months. Between these recurrent periods they were able to return to work and activity.

Their recurrent disability extended over the following periods of time:

TABLE 3

Duration of Recurrent Disability	Number of Patients
Over 10 years	1
10 years to 5 years	1
5 years to 1 year	4
Under 1 year and more than 2 months	1
Total	7

Although these seven patients had been able to work at least two months at a time before total thyroidectomy, their periods of disability were becoming more frequent, and there was every reason to believe that within a short time they would have become totally incapacitated.

### *Operative and Convalescent Periods*

These patients appreciated that continued medical treatment was palliative only, decreasing in effectiveness with increase in frequency and severity of attacks. Despite careful interpretation as to the experimental character of

lings, twelve other relatives, ten friends, twenty-nine private physicians and twelve social workers. All the interviews were carried on by one medical-social worker\* to insure uniformity of criteria and interpretation of data. Evaluations were made and conclusions were drawn by the joint authors of this paper.

#### *Description of the Patients Studied*

Of the forty-seven patients, twenty-six were male and twenty-one female. The age grouping is significant particularly in relation to the possibility of restoration to economic self-maintenance and occupational activity. Thirty-six or more than three-fourths of the group were over forty years old, the age which industry is increasingly regarding with disfavor and rating as unemployable. Ten were in the most productive period, between twenty-one and forty, and one patient was under twenty one.

Thirty-three or over two-thirds of the forty-seven patients were married and carried responsibilities either of breadwinner or homemaker. Six were widowed, divorced or separated and eight were single.

Grouped by religions, thirty-three were Jewish, six Protestant, seven Roman Catholic and one Greek Catholic.

There was considerable scattering as to place of residence. Twenty-seven or little more than one-half came from Boston, the remaining twenty from fourteen other cities. Three patients came from New York State, two from Rhode Island, one from Pennsylvania and one from Connecticut.

The occupations prior to illness were diversified. Of the forty-seven patients, five were classified as performing sedentary work, twenty-four as light physical and eighteen as heavy physical. Eighteen of the twenty-one female patients were housewives. They were included either in light or heavy physical work classification according to the responsibilities of the individual patient. Those women who did all of their work, including washing, ironing, scrubbing et cetera for large families were rated as performing heavy physical work, whereas those who did only light household tasks, with assistance from members of the family or others, were rated as doing light physical work.

#### *The Meaning of Chronic Cardiac Illness to Patient and Community*

Prior to the onset of cardiac illness, these patients from all walks of life were living normal lives, as students, industrial workers, housewives rearing and caring for their families. A study of the individual case histories in this series of patients reveals a tragic picture of personal and family distress. In the young people with the progression of disease there came

increasingly frequent periodic interruptions in school, with premature loss of opportunity for even rudimentary learning. The industrial workers, already trained and occupied in some chosen remunerative work, were subjected to experiences inevitably predetermined by serious cardiac disease, i.e., frequent work interruptions, increasing restriction of activity, cessation of all gainful employment, and the final withdrawal from normal life to an existence of chronic invalidism. In varying degrees this was similarly the experience of the housewives. The actual work of homemaking, training and care of children, the activities of their own personal social lives were encroached upon by an illness which removed them from their normal spheres, rendered them dependent on others for physical care and for financial assistance in the treatment of illness.

The destructive influence on the patient's emotional life of prolonged illness, incapacity, loss of financial support, change of occupation and altered living conditions is incalculable. To some patients life had become utterly meaningless, and they were "marking time for the end to come." Disorganized personal and family life had reduced many of these patients to despondency.

Financial dependence on relatives is some times possible but in long-time chronic illness the burden proves too great for many people and the responsibility ultimately falls upon the community. An attempt was made to estimate the approximate cost to society of chronic cardiac disease in this group of patients. In this appraisal of cost were included only actual hospital care, nursing and convalescent care, public and private relief. The many other services, outpatient care, medication, minor medical equipment of the sick room, et cetera, though involving considerable additional expenditure, were not included. Thirty patients were dependent, in varying degrees, either for medical care or economic support. The cost of hospital and nursing home care borne by the community was \$12,097.73\*. Financial relief was included in this study only when the patient's cardiac illness caused the family's dependency. Seven of these patients in the series became financially dependent upon public and private social agencies† because of cardiac disability before removal of thyroid gland. The estimated cost to the community was \$13,138.06. Therefore, \$25,235.79 is merely an approximation of the minimum expenditure for care of thirty patients, an index of the heavy cost to society of chronic cardiac illness.

\*The hospital and nursing home costs have been calculated on the per capita basis as quoted by each individual institution concerned.

†Public agencies were municipal departments of public welfare, federal government pension bureaus. Private agencies were Family Welfare Society and Jewish Family Welfare Association.

the handicap of long-time illness, required considerable encouragement to undertake new and increasing activity

A period of increasingly progressive activity varying in extent from two weeks to seventeen months followed convalescence during which the patient was able to increase his activity gradually, but was not yet able to be remuneratively employed outside of his home. This interim period was not necessary for all patients, as some were able to resume normal activity directly after convalescence. Tables 4, 5 and 6 demonstrate by months the variations in patients' condition and activity, from acute onset of illness to end of the period studied including

- (a) period of incapacity prior to operation,
- (b) convalescent period after operation,

- (c) period of progressively increasing activity,
- (d) period of actual employment,
- (e) period of capability of employment—no work available
- (f) subsequent period decrease in activity, and
- (g) subsequent period total incapacity

#### EFFECT OF TOTAL THYROIDECTOMY ON ACTIVITY AND EMPLOYMENT

The patients in this study have been classified into three groups A, B and C. In each group the duration and degree of employability following total thyroidectomy has been compared with the degree of incapacity prior to total thyroidectomy.

The term "employability" refers to (a) the patient's ability to work with his handicap, (b)

TABLE 5

24 PATIENTS TOTALLY OR RECURRENTLY INCAPACITATED PRIOR TO TOTAL THYROIDECTOMY  
UNABLE TO CARRY ON INDUSTRIAL OR FULL HOUSEHOLD WORK FOLLOWING OPERATION

Serial No	Diagnosis		Age—Years	Preoperative Incapacity—Months	Total Postoperative Period—Months	Convalescent Period—Months	Increase of Activity—Months	Subsequent Decrease of Activity—Months	Subsequent Total Incapacity—Months
	Etiology	Primary Symptomatology							
Industrial Workers									
17 $\frac{1}{2}$	A S	A P	60	132	24	2			22
19	A S	C F	63	48	22	1	3		18
62	A S	A P	67	48	13	1		6	6
59	R H	C F	29	36	15	2	1	6	6
5	A S	C F	55	24	26	1	25		
16	A S	A P	48	24	26	2	24		
49	A S	A P	54	24	17		17		
47	A S	A P	52	24	19	3	16		
64	A S	C F	58	24	14	1	2	6	5
50 $\frac{1}{2}$	A S	A P	53	18	18	2			16
58 $\frac{1}{2}$	A S	A P	42	13	15	1	14		
30	R H	C F	18	9	22	2	20		
46	A S	A P	58	9	19	1	18		
72	R H	C F	30	6	13	1	3		9
37	A S	C F	63	4	19				19
21	A S	A P	54	3	23	1	22		
Housewives									
35	R H	C F	47	84	17	2	5	5	5
24	R H	C F	48	36	24	1	6	17	
63	R H	C F	45	36	14	1	3	4	6
28	R H	C F	35	36	22	1	1	20	
40	A S	P A T	62	24	19	2	17		
48	R H	C F	45	24	18	3	15		
56	R H	C F	54	12	16	4		3	9
15	A S	A P	59	6	23	1		6	16

A. P. — Angina Pectoris  
A. S. — Arteriosclerotic Heart Disease  
C. F. — Congestive Failure  
P. A. T. — Paroxysmal Auricular Tachycardia  
R. H. — Rheumatic Heart Disease

± Indicates patients recurrently incapacitated before operation  
† Age at time of operation

total thyroidectomy and the risks involved, they all desired the opportunity for any possible improvement in their condition.

Convalescence, following the operative period, was a most important experience for them all. Assistance in arranging for care at home was given to a number of patients, while several required supervised care in nursing homes. In nearly all cases, the period of convalescence began after the patient had been discharged from the hospital, although in a few instances it was calculated from the time the patient was ready for discharge, during which time plans for his aftercare were being completed. The variation in length of convalescence from two weeks to four months was due to several factors, such as

differences in physical condition, emotional reactions, resources, and other complicating personal or family problems.

The personality of the patient played a significant rôle in all the postoperative experiences. For a number of these patients convalescence meant restoration to a state of well-being long since forgotten. Some patients able for the first time in years to lie in a recumbent position, sleep comfortably, and eat a normal diet, responded more favorably than others who had through wishful thinking anticipated an immediate and full participation in social life. Others, eager for a new life of activity, were resistive to the restrictions recommended by physicians. Another group, overtimidous, conditioned by

TABLES 4, 5 AND 6 DEMONSTRATE CONTINUOUS HISTORY OF ACTIVITY  
FOLLOWING TOTAL THYROIDECTOMY

TABLE 4

19 PATIENTS TOTALLY INCAPACITATED AND 4 RECURRENTLY INCAPACITATED PRIOR TO TOTAL THYROIDECTOMY  
EMPLOYED IN INDUSTRY OR AS HOUSEWIVES FOLLOWING OPERATION

Serial No	Diagnosis		Age—Years	Preop Incapac— Months	Total Postop Period—Months	Convalescent Period—Months	Progress Increasing Activity—Months	Duration of Employment— Months	Able to Work—No Positions—Months	Subseq Decrease Activity—Months	Subseq Total Incapac—Months
	Etiology	Primary Symptomatology									
Industrial Workers											
51-#	C H	C F	31	96	16	2	2	8*	4**		
31	R H	C F	22	72	20	2	17	1*			
14	A S	P D	55	36	24	2	2	10	10††		
1	A S	C F	52	24	30	2		28			
45-#	A S	A P	46	24	17	1		12		4	
22	A S	C F	59	24	21	2	5	8	5††	1	
25	A S	A P	65	22	25	2	5	3	15††		
52-#	R H	C F	34	18	18	2	2	14*			
11	R H	C F	22	14	26	2	6	18*			
42-#	A S	A P	64	7	17½	½		17*			
61	A S	A P	64	4	15	1	2	12*			
13	C P	C F	31	3	26	2	2	2		20	
73	A S	A P	55	2	12	3		9*			
Housewives											
54	R H	C F	50	144	16	2		7		7	
71	A S	A P	57	96	13	2	1	5		5	
9	R H	C F	42	60	24	1	2	14			7
12	R H	C F	44	36	27	4		23*			
65	R H	C F	36	36	13	3	1	3		6	
68	A S	A P	57	36	13	3	5	3		2	
44	R H	P A F	39	24	20	4	1	15*			
33	A S	A P	57	24	19	2	3	13		1	
27	R H	C F	51	24	22	2		8		10	2
43	R H	C F	46	9	20	2	4	14*			
A P	— Angina Pectoris				# Indicates patients recurrently incapacitated						
A S	— Arteriosclerotic Heart Disease				* Indicates still carrying on activity						
C F	— Congestive Failure				** This patient spent 4 months looking for						
C H	— Congenital Heart Disease				work which preceded 8 months of actual						
C P	— Cor Pulmonale				employment						
P A F	— Paroxysmal Auricular Fibrillation				† Age at time of operation						
P D	— Paroxysmal Dyspnea				†† Indicates ability to work but not employed						
R H	— Rheumatic Heart Disease				because of present economic situation						

# Indicates patients recurrently incapacitated

\* Indicates still carrying on activity

\*\* This patient spent 4 months looking for work which preceded 8 months of actual employment

† Age at time of operation

†† Indicates ability to work but not employed because of present economic situation

In Class C are patients who have been unable to increase their activity since operation. These patients report no subjective improvement.

There are twenty-three patients in Class A.\* Nineteen were totally incapacitated prior to operation and four recurrently incapacitated. Statistics up to the time of completion of this study showed that since complete removal of the thyroid gland of the nineteen totally incapacitated patients,

11 were active for 12 months to 28 months

3 were active for 6 months to 12 months

5 were active for 3 months to 6 months

The four patients in this class considered recurrently incapacitated prior to operation included one who for more than twelve months after operation had undertaken activity approximately equivalent to the effort demanded by her former occupation. Three patients were engaged in similar activity for periods from twelve months to seventeen months. The work of these four patients was done with a greater degree of comfort than prior to operation.

Two of the patients deceased before November, 1934, may be included in Class A, since one returned to his former occupation for four teen months, and the other, although not employed, was able to live an active social life for six months.

There are seventeen patients in Class B totally or recurrently incapacitated prior to operation, who state they have less cardiac discomfort or fewer attacks since total ablation of the thyroid gland, in spite of somewhat increased physical activity.

Six additional patients, deceased before November, 1934, may be included in Class B.

There are seven patients in Class C. One of the patients deceased before November, 1934, may also be included in Class C.

The primary symptomatology of patients in Classes A, B and C, is shown in the following table.

TABLE 7

	Totals	Congestive Failure	Angina Pectoris	Miscellaneous
Class A	23	13	8	2*
Class B	17	10	6	1†
Class C	7	3	4	
	47	26	18	3

\*Paroxysmal Dyspnea    Paroxysmal Auricular Fibrillation

†Paroxysmal Auricular Tachycardia.

Comparing the amount and duration of activity performed by patients with congestive failure and angina pectoris, one finds that 50

per cent of all the congestive failure patients and about 45 per cent of all the angina pectoris patients are in group A.

The primary symptomatology of nine patients deceased before November, 1934, is shown in the following table.

TABLE 8

	Totals	Congestive Failure	Angina Pectoris	Miscellaneous
Class A	2	1	1	
Class B	6	4	1	1*
Class C	1	1		
	9	6	2	1

\*Paroxysmal Dyspnea

The distribution of patients into activity, Classes A, B and C was made by the authors independently of the physicians' classifications\* made on the basis of the patients' physical improvement. However, after our categories were completed, a comparison was made of the medical and social groupings. It was found that twenty-nine evaluations coincided both according to clinical criteria and the criteria of work and activity.

There were differences in eighteen evaluations. Of these seven in Class A were considered medically slightly improved and one unimproved.

Six patients were included in Class B because the patients had had periods of at least three months during which their activity was greater than before operation. They had also claimed subjective improvement and were very definite in their opinions of the positive value of the procedure for them. Medically, however, they had been rated as not improved.

Three patients were in Class B because of lack of opportunity to judge their capacity through actual demonstrated work. One patient had returned to the State Infirmary due to lack of resources for rehabilitation in his own community. Another lived a life of leisure on a small private income. The third, a youth of twenty years, never having been employed in his life, could not be placed in industry but spent his time about the house. These three patients were considered medically to be greatly improved.

One patient was included in Class C because of her limited activity and unfavorable subjective reactions. The physicians considered her greatly improved because of marked diminution of cardiac symptoms.

#### Postoperative Activity of Industrial Workers

In our series of forty-seven patients were twenty-nine who had been engaged in industrial life. The remaining eighteen were housewives.

Dr. Blumgart and his associates. Unpublished material in Beth Israel Hospital Medical Research Department.

\*Table 4 on p. 4 shows the length of time following total thyroidectomy that nineteen patients totally incapacitated and four patients recurrently incapacitated were able to carry on useful occupation following operation.

the possibility of obtaining the type of work he is capable of doing, taking into account the present economic situation, and (c) the practice of most industries to employ neither the handicapped nor the middle-aged. The degree of employability was determined either by actual demonstrated work, or by the amount and type of general activity in the absence of employment opportunity.

The term "total incapacity", as used in the following classifications and tables, refers to patients completely bedridden for a period of two months or more, unable to carry on the usual activities of normal life, despite occasional periods of slight improvement. During periods of slight improvement, some patients were able occasionally to assist with the lightest household duties, take short walks out-of-doors, visit neighbors, or go to a park near-by. They were, however, unable to assume actual responsibility for any real work and frequently not even for their own physical needs. Their periods of total incapacity varied from two months to twelve years. From a medical point of view they were all chronic invalids who, prior to thyroidectomy were likely to be totally and permanently disabled.

"Recurrent incapacity" refers to patients

with acute exacerbations for periods of less than two consecutive months, who were able to return to work and activity when they were free from attacks. This group includes patients who were employed prior to operation.

The variations in degree of activity or employability after operation constitute the basis for classifying the patients in Class A, B or C.

In Class A are patients who have been able to

1. Do remunerative work by which they are rendered self-supporting, totally or partially, or

2. Assume full or partial responsibility for housework (with the exception of heavy laundry in most cases), or

3. Be up and about and live a normal social life. If not actively employed unemployment is due to limitations of community resources and the present economic situation rather than the patient's condition. These patients are able to take care of their own personal needs and enjoy some family life and recreation outside of the home.

In Class B are patients who, subjectively, show improvement, but who judging by objective standards have only slightly increased activity.

TABLE 6

DEMONSTRATING CONTINUOUS HISTORY OF ACTIVITY FOLLOWING TOTAL THYROIDECTOMY OF 9 PATIENTS  
DECEASED BEFORE NOVEMBER 15, 1934\*

7 INDUSTRIAL WORKERS AND 2 HOUSEWIVES TOTALLY OR RECURRENTLY INCAPACITATED  
PRIOR TO TOTAL THYROIDECTOMY

Serial No	Diagnosis		Age†—Years	Preoperative Incapacity—Months	Interim Between Operation and Death—Months	Convalescent Period—Months	Progress Increasing Activity—Months	Duration of Employment—Months	Subsequent Decreasing Activity—Months	Subseq Total Incapac —Months
	Etiology	Primary Symptomatology								
Industrial Workers										
7	A S	A P	57	6	18	½	3½	14		
32	R H	P D	21	24	12	4	6			2
3	R H	C F	27	21	12	3	6		3	
4	S H	C F	66	24	11	3	4		1	3
20	A S	A P	57	6	11	4			3	4
6	R H	C F	22	9	4	3	1			
23±	R H	C F	27	48	3	1½	1½			
Housewives										
36	H H	C F	38	84	13	3	6		2	2
39±	R H	C F	50	120	12	1				11

A P — Angina Pectoris  
A S — Arteriosclerotic Heart Disease  
C F — Congestive Failure  
H H — Hypertensive Heart Disease  
P D — Paroxysmal Dyspnea  
R H — Rheumatic Heart Disease  
S H — Syphilitic Heart Disease

= Indicates patients recurrently incapacitated

\* November 15 1934 represents the date when work on this study was begun

† Age at time of operation

they were able to be up and about and go out walking. Some of the patients have at times been able to assist with household duties or do occasional light work for a few hours when work was available.

Even in the period of decreased activity, these patients were able to do more than prior to total thyroidectomy and were, on the whole, more comfortable. The subsequent period of total incapacity found them again in their preoperative condition so far as lack of activity was concerned, but most of these patients claimed less discomfort.

Of the industrial workers in Class C, two (No 17 and No 50) presented difficult personality problems which interfered with their adjustment to their postoperative conditions. Two of them have been in bed the greater part of the time since total thyroidectomy.

### *Housewives*

There are eighteen housewives in the whole group studied ranging in ages from thirty-five to sixty-two years. The numbers and ages of dependents, and the financial situations of these patients varied. They came from different types of homes and their household responsibilities were not the same. Two (No 48 and No 54) had maids to do their housework, two (No 68 and No 71) had to share the homes of married daughters because of their own inability to do any work, while another (No 65) with her husband and three children lived in the home of her mother. The other thirteen housewives with complete household responsibility were unable before operation to do the work involved because of their cardiac illnesses. Their work included preparing food, cooking and serving meals, washing dishes, marketing and carrying heavy bundles, house cleaning, sweeping, dusting, bedmaking, scrubbing floors and woodwork, building fires in kitchen ranges and sometimes in furnaces, and washing clothes ironing and mending for their families. Prior to total thyroidectomy these housewives who had to spend the major part of their time in bed had been obliged to content themselves with the superficial assistance of children, relatives and neighbors.

Following total thyroidectomy, ten housewives were able for periods from three months to twenty-three months to assume full household responsibility (table 4). The activities of five housewives were increased to partial responsibility for their households for three months to seventeen months (table 5). The remaining three housewives (No 15, No 28 and No 56) assisted with light tasks for one month to six months respectively (table 5).

The following four brief case histories illustrate the amount and type of work accomplished

after operation by some of the housewives previously totally incapacitated.

B Z (No 9), who has a husband and two children was totally incapacitated for five years prior to total thyroidectomy. Her daughter, crippled by infantile paralysis, had been a factory worker, but was obliged to remain at home part of the time to care for the patient. At other times neighbors attended her. After total ablation of thyroid gland, Mrs Z did all of her housework with the exception of heavy scrubbing for fourteen months. Her daughter, therefore, relieved of her responsibility, was able to go to college in another state for the specialized training she needed for her work. Mrs Z was forced to restrict her activity when it was found that in addition to full housework she was taking long walks to reduce her weight. Her daughter in the meantime, has been able to finish her college work and has returned home to a responsible executive position instead of to the routine factory job she had previously. From her increased earnings, she has been able to relieve her mother of household responsibility by providing a maid as well as assisting the family financially in other ways.

L B (No 12), with no children, had been unable to do any of her housework for three years during which period it was done by her husband and neighbors except for the time she made her home with relatives. For twenty-three months since total thyroidectomy she has been doing all the housework, including laundry, and is still carrying on this activity. Despite the increased strain due to her husband's irregular employment his limited earnings, and the difficulty in managing on a meagre income Mrs B's capacity for activity has steadily increased.

R S (No 33) totally incapacitated for two years prior to total thyroidectomy after two months of convalescence and three months of progressively increasing activity has been doing all of her housework for thirteen months with the exception of washing (she did ironing and heavy scrubbing) arising at 6 00 a m every day to build the fire in the kitchen stove. In addition she danced frequently in the evenings. Her household consists of her husband three sons and a daughter all of working age and well able to do this heavy work for their mother. However she has insisted upon doing everything herself as she felt that care of the home was her own responsibility. After thirteen months of this activity, some restriction was enforced because of slight retrogression in her condition. In the three months following she has done only cooking dusting making beds et cetera which she terms light housework. The postoperative improvement in her condition released her daughter from housework and made it possible for her to secure remunerative employment as a saleswoman thus providing for her own economic independence.

S R (No 54) is the wife of a rabbi. Her only son is married. For twelve years before total thyroidectomy she was a chronic invalid and was obliged to have her married son live in the home so that his wife might manage the household. Within a year after operation Mrs R's gain in health made it possible for both families to reestablish their own homes. Her financial situation enables her to have some household assistance for the heavy work but she can assume responsibility for management herself. In addition to planning the meals and personally doing the marketing she spends her time visiting friends and relatives and has resumed the activities of a communal leader.



The industrial occupations varied from the sedentary work of an accountant to the strenuous physical work of day laborer. A comparison was made of the employment of the twenty-nine industrial workers before and after total thyroidectomy.

During the year prior to operation, none of these twenty-nine patients were able to engage in remunerative work for a period longer than two months. Fourteen were unable to engage in any work during this year. However, eleven who previously had been unable to engage in full-time work, were able to do so following total thyroidectomy. Two more patients in this group were able to work for short periods of time.

Of our group of seven deceased industrial workers previously known to the social worker, six had been totally incapacitated prior to total thyroidectomy, and one had been recurrently incapacitated. One of the totally incapacitated patients was able to undertake full-time heavy physical labor for fourteen months following operation, and another lived an active social life for a year.

It may be of interest to describe in some detail the activity of a few of the industrial workers who had had several months of remunerative employment after total thyroidectomy.

One fifty-two year old patient (No 1), a chronic invalid for two years prior to total thyroidectomy, who had been employed as a steward in large fashionable resort hotels, was repeatedly refused work after operation because he was considered a "poor risk." If he were accepted, employers feared an increase in their rate of workmen's compensation insurance. Despite his willingness to sign a waiver of liability, they continued to reject him. A well-read, intelligent man of real capacity, he would have been content with a minimum wage to provide only for food and shelter, although before the development of congestive failure he had commanded a very large salary. He finally succeeded in obtaining employment as a laboratory assistant, which involves walking about or standing all day, five and a half days a week. He is still active and well adjusted after twenty-eight months of continuous work.

A B (No 7) aged fifty seven a day laborer had been recurrently incapacitated for twelve months and totally incapacitated for six months prior to total thyroidectomy after which however he performed strenuously laborious work with pick and shovel on road construction for fourteen months continuously.\*

W D., aged twenty two (No 11) had worked as bus boy in a restaurant before congestive failure totally incapacitated and confined him to a chronic hospital for fourteen months before total thyroidectomy. The operation changed his status from a

chronic patient to an individual able to take up life in the community. His utter lack of personal resources made it necessary for the social worker to assist him to develop a program for a renewed life in the community. Two months of convalescence and six months of gradually increasing activity rendered him ready for work. Our doctors recommended a sedentary occupation. During childhood and adolescence his schooling had been continually interrupted and finally terminated by acute exacerbations of rheumatic heart disease. With no training for work of any kind, it became necessary to ascertain his abilities and aptitudes. The resources in Boston for work placement for the handicapped are limited. The only place available for him was a sheltered workshop where he sorted yarns and made sample color cards. He adjusted well, increasing the volume of work till he received the maximum salary, which, supplemented by the Department of Public Welfare, met his minimum needs. After a year at this type of activity, the security resulting from his improved physical condition created discontent with this protected occupation and an increasing desire for financial independence and a place in normal industrial life. Again because of the present economic situation no job was to be found. The only work approximating his ideal was a Federal Emergency Relief Administration project for the handicapped. Here he has been working for almost a year operating a power sewing machine, earning enough to provide him with the necessities of life without help from any other source. Not satisfied with these activities alone, in addition to six hours of work daily four days a week, he has been studying hard at night to prepare himself for further advancement when business conditions improve and openings in competitive industry become available.

Another patient (No 22), fifty nine years old, who had always been a day laborer, secured work as a porter in a café. The salary was very small and the hours long. When he had not been granted an increase in wages after eight months of laborious work he gave it up and with a small income just enough to provide for his own and his wife's needs he decided not to take another job.

Of the twelve industrial workers in Class B nine over forty one years old were considered unemployable following total thyroidectomy due to a general industrial policy not to employ the middle aged or the handicapped in need of short rest periods during the day. In this group are included patients capable of performing light work, but prevented from doing so because of the problem of transportation to and from work. The complex system of street railways in Boston supplemented by elevated and subway steps in some districts, necessitate many changes and much stair climbing. The energy consumed by travel unfits the patient for work before he actually begins. In a small community this difficulty could have been obviated. One patient in this group (No 58) probably would be able to do some light work but has preferred not to be employed because his small private income allows him to spend his winters in Florida and his summers in Boston, enjoying some social life.

During the time that these patients had in crease of activity over the preoperative period

\*This patient is in the group deceased before November 1934. See table C.

tacks or severe shortness of breath had deprived them of work and social life. To move more slowly meant no real sacrifice when the choice lay between inactivity and opportunities for a fuller life.

From the social point of view, there are five unmistakably maladjusted patients who were not improved by total thyroidectomy as postoperative conditions served to magnify their personal disharmony.

Adverse effects from artificial myxedema induced by operation have been on the whole controlled by doses of thyroid according to each patient's needs. In studying the various attitudes of patients and others interested one may say that those patients who were able to make the adjustments required by postoperative conditions were the same individuals who all through life had been able to adjust easily to changing situations. The patients who were irritable were the same who had always had mood swings had been fault-finding and never ready to accept change of conditions without marked emotional reaction. It seems fair to conclude that for most of our patients the untoward effects of the hypothyroid state were insignificant as compared with the complex and serious emotional reactions caused by chronic cardiac disease itself.

Experience suggests that in the selection of patients for this form of therapy, thorough study should be made of the patient's general adaptation to his total life experience. Since this operation is not curative but aims to increase the patient's comfort and capacity for activity it may be differentiated from operations performed for conditions such as acute appendicitis, cholecystitis, et cetera. If a patient's personality and adjustment to life is such that he is unlikely because of great anxiety, to utilize an increased capacity for activity, the operation should be offered with reservation. The possibility of postoperative psychological problems for some patients is a factor worthy of consideration.

#### THE APPRAISAL OF TOTAL THYROIDECTOMY BY THE PATIENTS AND THEIR FAMILIES

Total thyroidectomy had been offered to individuals after years of invalidism from chronic intractable heart disease when all other medical treatment proved of no avail. The value of the procedure to patients who were enabled to work or live a more active life was inestimable. In nearly all other cases even when increase of activity was not considerable the patients were thankful for relief from pain and fewer anginal attacks. Considered in the light of preoperative conditions, this absence of pain and symptoms were significant for the patient. Seven patients expressed profound gratitude for

"prolongation of life" in such improved physical condition as to enable them to continue to exercise a vital influence in their family and business relationships.

In ten families, anxiety about the patient was greatly diminished following the operation. This did not mean lessened interest or devotion on the part of the family, but rather a release from the excessive strain and worry induced by the patient's serious condition. Members of these families have been able to carry on their own work, their social and recreational activities without constant dread of an emergency call home any time of day or night because of the patient's acute severe "heart attack." The diminution of patients' severe cardiac symptoms has enabled relatives to pursue their own interests, no longer reluctant to leave the patient at home alone.

To five women, daughters of five patients, it has meant opportunities to fulfill their own lives by relief from the household responsibilities of their mothers. One girl has married and moved to a distant city. Another has gone to college in another state. A third has accepted remunerative work and contributed to the family income. A fourteen-year old girl has been able to continue school and live the normal life of an adolescent, released from cooking and heavy housework. The fifth woman, herself ill with arthritis, has been free to rest and improve her own health.

Among the advantages reported by the patients are relief from pain and discomfort, an end to invalidism, ability to work and earn, and opportunities to enjoy normal family and social life. To many families it has contributed a release from excessive anxiety, unevenly distributed burdensome work, financial strain and disturbed domestic relationships, as well as increased income, greater sense of economic security and realization of individual personal plans. Improvement in human relationships has been enhanced for most of the forty-seven patients included in this study.

Evaluations of this therapy by patients and families merit serious consideration inasmuch as one of the acknowledged aims of all health programs is the increase of personal satisfaction and social effectiveness.

#### SUMMARY

1. A study has been made of forty-seven living patients treated by complete removal of thyroid gland for intractable chronic cardiac disease. The objective of the study was to learn whether and to what degree, this form of therapy had enabled these patients to overcome their handicaps for normal social living. In all cases one year to two and one half years had elapsed since operation.

attending meetings working on committees of numerous ladies aid societies, arranging bazaars and other charitable enterprises. All of this activity consumes a considerable amount of energy.

#### EFFECT OF TOTAL THYROIDECTOMY ON PERSONALITY

The physicians carrying on the investigation of complete removal of thyroid gland as treatment for cardiac disease have considered the possibility that the untoward symptoms of myxedema induced by the operation might offset some of the benefits gained for the patient's cardiac condition.<sup>3</sup> With this possibility in mind an attempt has been made in this study to ascertain the probable influence of these symptoms on the patient's postoperative adjustment to a normal way of life.

The data secured by inquiry into the patient's subjective reactions and behavior are presented here as the evaluations of the patients themselves, relatives, family physicians and friends who were well acquainted with the patients over a long period of time both before and after operation.

Many patients made an interesting psychological adjustment to their illness following operation. Some patients exhibited considerable anxiety coincident with their initial postoperative improvement, fearful that as in the past they would on increased activity suffer a relapse and would have to undergo the deeply disturbing experiences of decompensation and angina pectoris which were still vivid in their minds. As time progressed, however, and they found that their fears were not supported by experience they developed an increasing sense of security which enabled them to make a more successful adjustment to their environment.

Approximately twelve patients noted no personality change whatever. Two of these patients had been in hospitals for chronic disease for several months prior to operation. At the time of operation they had considered they were finished with life and were "waiting for the end." They were resigned and had built up a philosophy of life that prepared them to meet any situation. Two others were men of phlegmatic type, always calm, easy-going and good-natured, never given to undue worry or concern. Another patient was an unmarried young woman of a congenial devoted family with whom she had always been compatible. Seven were housewives who seem to have been well adjusted in their homes prior to total thyroidectomy and were able to return to the same home situations.

Some patients reported they had become happier and more agreeable. The most important single factor responsible for this change was the hope of becoming economically self-maintaining. Poverty due to prolonged illness with

no opportunity for improved status has a progressively deteriorating influence on personality. On the other hand, the ability to compete on an equal footing with others, to be economically productive, and to carry normal responsibilities developed a sense of security of tremendous significance for the patient.

Other patients and their families mentioned reactions of irritability, depression and slowing up of activity. Twenty-one patients described varying degrees of irritability. Their greatly improved condition following operation, relief from pain, greater ease in breathing, greater comfort in lying in a recumbent position led about half of this group to expect a return to the unlimited activity they had enjoyed before they had ever been ill with cardiac disease despite the conservative prognosis for life and activity interpreted to them by the physicians prior to operation. Several patients were more irritable on returning to their homes after operation because of difficult financial and domestic situations unrelated to total thyroidectomy.

Four patients of the forty-seven were very much depressed and despondent. One of them had accepted the operation with the expectation that she would die and that her unemployed husband might benefit by her insurance. Instead of dying, she was enabled to assume her household responsibilities. In her estimation, the operation only made her an added burden to her husband. Her attitude later improved with changed economic conditions. Another patient, sixty-four years old had hoped to be able to carry on with no restrictions after operation. The realization that he had to yield part of his work assignments to younger men, suddenly made him aware that he was getting old. As he came to understand his situation better he knew that his discouragement was due to the fear of oncoming age.

The patients were asked to compare the time element in performance of usual physical tasks before and following total thyroidectomy. The results were as follows: one, quicker, eight, no difference, thirty-eight, slower. Inquiring into the effect on work and personalities of this slower tempo, most of these thirty-eight patients stated that they were able to accomplish their daily assignments satisfactorily with no effect on work or personality. A few, describing themselves as quick-tempered, became calmer, several became somewhat more irritable as a result of the slowing up process.

Inasmuch as most of these patients had been confined to bed for long periods of time prior to operation, actual increase in activity even at a somewhat retarded rate was most acceptable to them. Chronic illness had taught them that time considered by itself was of little importance. Quick action resulting in anginal at-

Serial No 3 Unit No 17641 (rheumatic heart disease congestive failure mitral stenosis and insufficiency)

A twenty seven year old married American Protestant day laborer had been recurrently incapacitated for six years and totally incapacitated for two years prior to total thyroidectomy on March 17 1933. After operation the patient went to a Soldiers Home for convalescence because his wife had deserted him and their five children. For about eleven months until his death in February 1934 he lived an active life in the institution doing many chores about the place without remuneration and playing baseball for exercise in his spare time (Class A.)

Serial No 4 Unit No 17712 (syphilitic heart disease congestive failure auricular fibrillation)

A sixty six year old single American Catholic farmer was recurrently incapacitated for four years and totally incapacitated for two years prior to total thyroidectomy on March 23 1933. Because of lack of resources for rehabilitation in his community he was discharged to an institution for chronic patients following his operation. Here his activity was somewhat increased during the eleven months he lived. The patient expired suddenly on February 20 1934 (Class B)

Serial No 5 Unit No 17714 (arteriosclerotic and hypertensive heart disease congestive failure angina pectoris paroxysmal dyspnea cardiac asthma Paget's disease)

This fifty five year old American Catholic shoe designer has been estranged from his immediate family group. Illness had caused unemployment since 1931. For seven months prior to total thyroidectomy on March 24 1933 he was bedridden at the State Chronic Hospital with frequent anginal attacks. After operation he returned to the institution. He has been free from anginal attacks ambulatory and at work in the occupational therapy shop. Whereas prior to operation he had no hope of improvement he is now planning to return to the community as soon as work is available for him. The patient is contented and happy and feels that the operation was well worth while (Class B)

Serial No 6 Unit No 17713 (rheumatic heart disease congestive failure paroxysmal dyspnea mitral stenosis and regurgitation aortic regurgitation aortic fibrillation)

A twenty two year old single American Protestant truck driver was recurrently incapacitated for thirteen years and bedridden in a hospital for the chronic sick for nine months prior to total thyroidectomy on March 25 1933. An orphan for many years in institutions he insisted upon living in the community after three months of convalescence and gradually increasing activity. Despite medical restrictions and warnings the patient had a month of participation in active life normal to a young man of his age because he felt "well strong and healthy". He attended baseball games took long walks went to the beaches and was excessively active as a result of which an acute exacerbation brought him back to the hospital where he died on August 1 1933 (Class B)

Serial No 7 Unit No 17492 (arteriosclerotic heart disease angina pectoris)

A fifty seven year old German Catholic day laborer living with his wife and four children had been totally incapacitated for eighteen months prior to total thyroidectomy on April 1 1933. Four months after operation he returned to his job which required him to do strenuous work with pick and shovel on road construction. He continued at this without interruption until his sudden death four

teen months afterward on October 20 1934 (Class A.)

Serial No 9 Unit No 16183 (rheumatic heart disease congestive failure mitral stenosis auricular fibrillation)

Until October 1932 this patient a forty two year old Russian Jewish housewife with husband and two children did some of her housework despite her cardiac illness. From that time until total thyroidectomy on April 8 1933 she was almost completely bedridden at home. Illness deprived her of the capacity to care for her household and children. She became self-centered dissatisfied moody and pessimistic creating an almost intolerable problem in the home. Following operation she showed gradual improvement in health, became more optimistic and agreeable and for more than a year was able to assume without interruption full care of her home. This relieved the serious domestic tension. The daughter crippled by infantile paralysis had divided her time between household responsibilities and factory work. While the patient improved the daughter was enabled to secure college training and finally to better her economic status. An acute exacerbation in November 1934 was the result of complex physical and social factors. Total thyroidectomy has been of inestimable value to the patient. Her improvement has provided new opportunities for the daughter increased family income and prevented a serious domestic situation. She and her family are enthusiastic about benefits derived from the operation (Class A)

Serial No 11 Unit No 17976 (rheumatic heart disease congestive failure mitral stenosis and insufficiency)

From the age of eight, heart disease deprived this twenty two year old American Catholic orphan of education play normal companionship and regular occupation. His illness gradually produced a taciturn morose illtempered youth with asocial tendencies. Ten months prior to total thyroidectomy on April 15 1933 he was a bedridden patient in a public infirmary with an extremely poor prognosis for life. Operation brought about striking changes. Nine months afterward he was employed in a sheltered workshop with work gradually increased to the maximum. With better health and normal life actually within his reach he has willingly accepted slight activity limitations. He has demonstrated a degree of stability almost incredible for him by remaining at work for eighteen months. In addition he is improving his education by study and his economic status by securing a better job. By an extraordinary personality change he has become a spirited young man with new interests in life. The results in adjustment to a normal life in this case are exceptional (Class A.)

Serial No 12 Unit No 17990 (rheumatic heart disease congestive failure mitral stenosis and insufficiency auricular fibrillation)

A forty four year old Canadian Protestant housewife with a history of rheumatic heart disease for twenty five years lives at home with her husband a carpenter with meager earnings.

The husband had done the housework periodically because of the patient's illness which gradually incapacitated her until she required almost continuous bed care for three years prior to operation on April 17 1933. As a result of her chronic cardiac invalidism she was deeply depressed stubborn unreasonable and often unwilling to accept medical recommendations. For about a year after total thyroidectomy there was increasing physical improvement. With a gradual appreciation of the reality of her improved health and a growing sense

2 Fifty-five per cent of the patients were operated upon for the relief of congestive failure, thirty-eight per cent for angina pectoris, seven per cent for miscellaneous cardiac conditions

3 Prior to total thyroidectomy, forty patients had been economically totally disabled, and seven had for several years experienced repeated periods of recurrent incapacity covering two consecutive months or less

### CONCLUSIONS

1 Following total thyroidectomy, from the point of view of work activity, forty of the forty-seven patients had increased activity in varying degrees and lived with more ease and comfort. Twenty-three of them were able to take up remunerative work or complete household responsibility for periods of three months to two and one-half years following total thyroidectomy. Seventeen patients increased activity slightly and seven patients had no increase of activity. Remunerative employment for some patients was not available during this period because of the widespread unemployment of able-bodied men and women. The most favorable group contained half of all the congestive failure patients and a somewhat smaller number of angina pectoris patients.

2 As to the influence of total thyroidectomy on personality, on the whole, the ability to make necessary adjustments to a new mode and tempo of life has depended on the constructive elements inherent in the individual personality. The type of emotional reaction to this therapeutic experience has varied according to the individual differences in each personality. For five patients known all through life as maladjusted personalities, the operation was probably inadvisable, because of their unfavorable emotional reactions.

3 This therapy as evaluated by patients and families has been distinctly worth while for forty-two living patients. Judged by data on nine deceased patients, it had a very considerable value for several of them.

4 From the point of view of the community, there have been undoubted values derived from this procedure. Institutions for chronic illness have been able to curtail long hospitalizations for some. Community dependence has been reduced. Economic productivity has been made possible for some patients, earning power has been increased for many more.

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### APPENDIX 1

#### CASE SUMMARIES

The following statements summarize briefly the medical and social situations of the patients included in this study.

Serial No 1. Unit No 15022 (arteriosclerotic and rheumatic heart disease, congestive failure, angina pectoris, auricular fibrillation).

Prior to his first cardiac illness in 1930, this well educated, fifty-two year old\* Swiss Jewish widower with no family was a hotel steward earning approximately five hundred dollars a month. During the following two years his gradually increasing incapacity finally led to the termination of all work and to destitution. At the time of operation December 15, 1932, he had been confined to bed in a chronic hospital for five months. Three months after operation unable to secure work as steward, he accepted employment as a laboratory assistant working eight hours daily walking or standing most of the time and has continued to be a productive member of society without interruption. As a result of total thyroidectomy the patient previously entirely incapacitated is now able to lead a life of normal activity and interests with a definite feeling of physical and economic freedom and security that he has not enjoyed for many years. (Class A.)

\*Age given in these summaries is age at date of total thyroidectomy.

Cardiac illness over a period of six years gradually incapacitated him. Until three months prior to total thyroidectomy on July 24 1933, he could do no work whatever. He feels that the procedure has helped him by reducing the frequency and severity of attacks. Others who knew him prior to total thyroidectomy feel that he is considerably improved. Prior to illness a very active man he became somewhat apprehensive because of inability to return to strenuous work at once. Nevertheless with gradually increasing activity he feels that the operation has been worth while. His family concurs with him in this opinion. (Class B)

Serial No 22 Unit No 19061 (arteriosclerotic heart disease congestive failure auricular fibrillation)

Four years prior to total thyroidectomy this fifty-nine year old married American Catholic laborer developed cardiac illness, which caused periodic unemployment at first, and later continuous unemployment. Following total thyroidectomy on July 25 1933 he gradually improved until in December 1933 he became employed as a porter in a barroom. In August 1934 he left this job because of a wage disagreement but is supported by a forty-five dollar monthly pension. His wife employed as housekeeper, lives with relatives. He felt that the operation gave him 'a new heart' and made him calmer. He gave up completely his habit of heavy drinking. Total thyroidectomy greatly benefited him by enabling him to live a normal life for a period of twenty months following the procedure. His wife and relatives were enthusiastic about his improved physical condition and increased emotional stability. While still enjoying an active social life he died suddenly on April 24 1935 following the erroneous administration of overdoses of thyroid in another institution. (Class A.)

Serial No 23 Unit No 19060 (rheumatic heart disease congestive failure auricular fibrillation mitral stenosis and insufficiency aortic insufficiency)

A twenty-seven year old single American Catholic billing clerk recurrently incapacitated for four years prior to total thyroidectomy on July 27 1933 was more comfortable and lived a more active social life for three months after operation than she had previously. She was about to resume her preoperative occupation when she died suddenly on October 27 1933 of pulmonary embolism. (Class B)

Serial No 24 Unit No 19021 (rheumatic and hypertensive heart disease congestive failure mitral stenosis and insufficiency auricular fibrillation)

This forty-eight year old American Catholic housewife makes her home with seven children and husband an employed laborer.

Up to three years prior to total thyroidectomy on January 28 1933 she was well and active. Later she developed congestive failure and required eight hospitalizations interrupting care and supervision of her family. Her chronic invalidism and inability to work caused considerable marital friction. For about six months after operation the patient was improved. She was free from pain could breathe more easily do most of the housework and attend church. The difficult domestic situation led her to undertake an inordinate amount of work which later affected her condition adversely. However she believes she has been improved by total thyroidectomy. The husband is not enthusiastic about her postoperative condition because of her inability to assume entire care of the household. (Class B)

Serial No 25 Unit No 19057 (arteriosclerotic heart disease angina pectoris congestive failure chronic bronchitis asthma)

This sixty-five year old American Catholic Spanish War veteran pensioned at forty-five dollars monthly lives with his wife at the home of a married daughter upon whom he is partially dependent for support.

He had been able to earn a good living as a silk salesman until cardiac illness incapacitated him in 1932. At the time of the total thyroidectomy on July 31 1933 he was confined to bed. Following the operation he greatly improved and returned to his former occupation but discontinued it after three months because the financial returns were small and he was obliged to do an excessive amount of talking and walking. He feels well now, has a cheerful outlook, lives an active social life and believes he could do sedentary work if such were available. His wife states that total thyroidectomy has greatly improved his health and has given him 'a new lease on life'. In evaluating his preoperative condition the patient said he had felt like a criminal who would be caught any day but since operation he has felt free. (Class A)

Serial No 27 Unit No 17529 (rheumatic heart disease congestive failure mitral stenosis aortic insufficiency auricular fibrillation)

For twenty years rheumatic heart disease had gradually incapacitated this fifty-one year old Russian Jewish widow and had rendered her and two children dependent on charitable agencies. For a period of two years prior to total thyroidectomy on August 9 1933 she was bedridden the children assuming responsibility for her care and that of the household. The patient was a sensitive domineering worrisome woman. Persons interviewed including the patient, stated that for about one year after the operation she was able to do housework attend movies and occasionally to go to market and travel by subway to the city. None of this activity had been possible the two years before total thyroidectomy. Since the fall of 1934 however slight activity produced fatigue and shortness of breath. For about two months her health gradually declined and she died on May 20, 1935. Relatives believed that before her death she had greatly benefited by the operation, and even after her death they considered the procedure distinctly worth while. For several months her condition was considerably better than for many years previously enabling greater activity and more enjoyment of life. (Class A.)

Serial No 28 Unit No 15244 (rheumatic heart disease congestive failure)

This thirty-five year old Russian Jewish housewife with two minor children and husband an irregularly employed painter shares a flat with the patient's sister and her family. The sister is supporting the entire family and giving the patient the necessary care. The home is overcrowded.

Despite her six years illness with rheumatic heart disease she was able to do ordinary household duties in her own home until July 1932 when she became incapacitated and remained so until total thyroidectomy on August 21 1933. Following operation she felt improved for four to five weeks and was able to assist with some housework. Since then although she has been free of pain in the region of the heart she has been practically an invalid. The general feeling among relatives doctors and nurses is that the patient's personality is a large factor in producing her invalidism. She has always been an easily excited hysterical woman and very dependent upon her sister. It is questionable whether a person of this type can respond favorably to total thyroidectomy. (Class C)

Serial No 30 Unit No 19504 (rheumatic heart disease congestive failure)



of security, she has become more hopeful more agreeable and more amenable to suggestion. She has been doing her own housework including the laundry without pain and without shortness of breath. She and others interviewed believe that the operation has been decidedly worth while (Class A.)

Serial No 13 Unit No 18000 (cor pulmonale congestive failure angina pectoris paroxysmal dyspnea asthma)

This thirty-one year old American Catholic married man was employed for many years in a sedentary occupation as a receiving clerk. Since 1929 severe asthmatic attacks and congestive failure interrupted his work frequently. Four months after operation on April 18, 1933 he returned to work for two months. The work and transportation to a new factory site eighteen miles distant proved overtaxing but since that time, although not remuneratively employed, he has been able to undertake increased physical exertion. His physical condition has shown continued improvement his cardiac pain and asthmatic attacks being less severe than prior to the operation. Patient and relatives consider that the operation has been decidedly worth while and that he could work if suitable employment were available (Class A)

Serial No 14 Unit No 18150 (arteriosclerotic heart disease, paroxysmal dyspnea angina pectoris congestive failure)

This fifty-five year old Austrian Jewish patient with his wife and adopted daughter share a flat with relatives.

In 1927 he learned of his cardiac condition during an insurance examination. He felt fairly well however, and was able to earn moderate wages as a furniture salesman until March, 1933, when he developed severe heart attacks requiring hospital and bed care. On June 9, 1933 total thyroidectomy was performed. Five months later he returned to his former occupation, which he discontinued after eleven months because of its strenuous nature. Due to the present economic situation the patient unable to secure lighter work has remained unemployed. He and his family feel that the operation has helped him by great relief of pain and easy breathing. His private physician stated that more than a year of activity had been added to the patient's life. They all consider the procedure was decidedly worth while (Class A)

Serial No 15, Unit No 18569 (arteriosclerotic and hypertensive heart disease angina pectoris, diabetes mellitus)

Cardiac illness had practically incapacitated this fifty-nine year old Dutch Catholic housewife for about seven years. She had to give up her own home and depend upon her husband a cigar maker for care in a furnished room. Total ablation of the thyroid gland on June 22, 1933 relieved her of excessive pain and other extreme discomfort, and permitted increased activity for a six month period after which her condition became approximately the same as before. The patient's inflexibly stubborn personality handicapped medical supervision by her refusal to co-operate in carrying out recommendations. She is one of the group whose adjustments to all life situations have been difficult. She and her family feel that despite improvement for six months, total thyroidectomy was not worth while (Class C)

Serial No 16 Unit No 9175 (arteriosclerotic and hypertensive heart disease angina pectoris residual right hemiplegia)

This forty-eight year old Russian Jewish married

man lives at home in a family group of seven members all unemployed.

His first anginal attack came in 1928 concurrently with the failure of his manufacturing business. His activity was increasingly restricted and though ambulatory he was unable to work. In 1930 his family became dependent on community funds for its entire support. Since total thyroidectomy June 30, 1933 the ability to undertake increased activity has been definite. All the family agree that attacks previously agonizing are less severe and although the wife states that "patient was brought back from death to life" it is impossible to judge the exact degree of improvement because of a cerebral vascular accident and the patient's reactions to reduced economic status (Class B)

Serial No 17 Unit No 19508 (arteriosclerotic heart disease angina pectoris)

A sixty-year old single American Jewish woman intelligent and well educated was able to earn a substantial salary as secretary until she became ill with angina pectoris eleven years ago, following which she did artistic handwork and sewing earning enough to maintain herself between periods of incapacity. Total thyroidectomy on July 1, 1933 definitely reduced the severity of her anginal attacks. The control of myxedematous symptoms has been difficult and the patient's adjustment to life has continued to present problems. Savings upon which she has been living are almost depleted and she dreads the possibility of dependence. She does not believe that the operation has been worth while (Class C)

Serial No 19 Unit No 18729 (arteriosclerotic heart disease congestive failure, paroxysmal dyspnea pulmonary emphysema)

Cardiac disease in this sixty-three year old American Protestant cement worker had prevented employment at his trade for many years. In 1929, because illness forced him to become unemployed his wife assumed the rôle of breadwinner. He and his wife live in a furnished room. While the wife is at work during the day someone is paid to attend to the patient's needs. Embarrassment due to reduced social status has caused estrangement from relatives. Total thyroidectomy on July 6, 1933 increased his activity for about three months. Although his medical condition has not shown improvement, both patient and wife are indebted to the operation for "prolonging his life and making him vastly more comfortable. They feel that the operation has been decidedly worth while (Class B)

Serial No 20 Unit No 18973 (arteriosclerotic heart disease angina pectoris)

This patient a fifty-seven year old Russian Jewish farmer with a diabetic wife and four adult children was totally incapacitated for two years prior to total thyroidectomy on July 22, 1933. His postoperative activity was increased over preoperative activity for a period of four months. Carcinoma of the stomach caused his death on June 18, 1934. The nature of this illness made impossible an accurate evaluation of total thyroidectomy from the point of view of activity although there had been definite subjective improvement and some increase in activity (Class B)

Serial No 21 Unit No 18961 (arteriosclerotic heart disease angina pectoris asthmatic bronchitis pulmonary emphysema)

A fifty-four year old Russian Jewish man formerly a fruit huckster lives in a third floor apartment with his wife three single daughters and one son. The earnings of two daughters are insufficient to meet family needs adequately.

Serial No 40 Unit No 13664 (arteriosclerotic and hypertensive heart disease paroxysmal auricular tachycardia)

Patient a sixty-two year old Russian Jewish housewife lives at home with her husband and three sons, receiving community assistance

The patient's cardiac illness of about seven years duration incapacitated her entirely for two years prior to total thyroidectomy. The sons then assumed the responsibility for the care of the patient and household. Following total thyroidectomy on November 21, 1933 she was able to increase activity gradually. Since the summer of 1934 her work has been sedentary, limited to sewing and mending. The patient and family state she has been feeling better since the operation, as her attacks are less frequent and less severe. (Class B)

Serial No 42, Unit No 20325 (arteriosclerotic heart disease angina pectoris)

Prior to total thyroidectomy on November 22, 1933, a sixty-four year old economically independent Canadian Baptist painter had been periodically unemployed because of cardiac illness of one year's duration. After operation he was able to return at once to the same occupation and resumed a life of somewhat limited social activity. A decrease in the frequency and severity of anginal attacks since operation has produced a new sense of security in both patient and wife. The patient believed that without total thyroidectomy return to full time work would not have been possible. (Class A)

Serial No 43, Unit No 20217 (rheumatic and hypertensive heart disease congestive failure paroxysmal dyspnea)

Patient a forty-six year old American Protestant housewife living at home with her husband and three adult children in rather strained financial circumstances was in good health and very active with household and recreational activities until her first heart attack in February 1933. From that time until total thyroidectomy on November 23, 1933 she was totally incapacitated. Her frequent heart attacks were a source of great concern to the family. Since operation with greatly improved health she has been able to increase activity gradually. The tension in the household previously caused by the patient's frequent attacks, has been relieved. In addition to full household responsibility she has resumed an active social life. The patient's enthusiasm is shared by her friends who described the result of the operation as 'giving life to a dead person'. (Class A)

Serial No 44 Unit No 20365 (rheumatic heart disease paroxysmal fibrillation angina pectoris paroxysmal dyspnea mitral and aortic stenosis and insufficiency)

This thirty-nine year old Jewish housewife lives at home with her husband a capmaker irregularly employed

Since her first heart attack in 1929 the patient's activity gradually diminished and eight months prior to total thyroidectomy on November 24, 1933 she became bedridden. The patient and household were cared for by a fourteen-year-old daughter and neighbors. For four months following operation the patient remained in bed. She then gradually resumed activity and for the past year has been doing all the housework excepting laundry and heavy scrubbing and has been attending movies and visiting friends. The patient and family believe that total thyroidectomy has been definitely worth while. Her private physician who has known her for many years said nothing short of a miracle can describe the result of the operation for this patient. (Class A)

Serial No 45, Unit No 20441 (arteriosclerotic heart disease angina pectoris)

A forty-six year old American Jewish mechanic, lives in a first floor apartment with an unemployed brother whom he supports

His health was good until 1931 when angina pectoris gradually decreased his capacity for work and caused him considerable anxiety. His physician recommended total thyroidectomy which was performed on November 25, 1933. The patient returned to his former work and continued with it successfully for one year. Afterward he again had some anginal attacks which together with a deeply disappointing personal experience has reduced his activity to some extent. (Class A)

Serial No 46 Unit No 14779 (arteriosclerotic heart disease angina pectoris)

A fifty-eight year old American Jewish merchant who gave up business in 1931 because of his cardiac condition lives in a good home environment with his wife and a son who supports the household

For nine months prior to total thyroidectomy on November 27, 1933, the patient was practically bedridden. Following total thyroidectomy he has had more activity with only an occasional day in bed. He states that he has less pain and feels better than he did. His family and a nephew who is a physician believe that the operation has prevented the progress of symptoms and afforded him a better adjustment to life. (Class B)

Serial No 47, Unit No 16857 (arteriosclerotic heart disease angina pectoris)

For fifteen years a fifty-two year old Polish Jewish widower had been recurrently incapacitated by cardiac disease. Three years prior to total thyroidectomy his failing health obliged him to give up his small business and become dependent on four adult children for financial support. Prior to total thyroidectomy on December 1, 1933, frequent intervals of complete invalidism greatly restricted his activity. Total thyroidectomy has accomplished the diminution in frequency and severity of attacks. The patient is very grateful for the gains in his condition. The death of his wife has had some adverse effect on his emotional reactions. Later, however, his son-in-law considered him as generally improved. (Class B)

Serial No 48 Unit No 20634 (rheumatic heart disease congestive failure mitral stenosis and insufficiency aortic insufficiency)

A forty-five year old American Jewish housewife lives at home with two young children and her husband a salesman in moderate financial circumstances

For two and one-half years prior to total thyroidectomy on December 15, 1933 she was an invalid spending most of her time in bed or sitting in a chair. For six to eight months following thyroidectomy her activity was increased. She was able to visit and entertain friends in her home. Later however following the death of two members of her family from heart disease her condition regressed. The patient stated she knew she was alive only because of the operation. The family and her private physician feel definitely that her improvement is the result of total thyroidectomy. (Class B)

Serial No 49 Unit No 19970 (arteriosclerotic and hypertensive heart disease angina pectoris congestive failure)

A fifty-four year old Syrian Orthodox man of good educational background lives at home with his wife and three young children

Formerly a merchant and salesman the patient led an active business and social life until 1928. From that time until December 1931 he was periodi-



This eighteen year old American Protestant lives in a sordid home of ten individuals on a marginal income. He made little progress in school which he cordially disliked, and had trouble in finding work. After several weeks as helper on a milk truck (his only job), he became incapacitated in November, 1932. Severe chronic heart disease brought him to the State Infirmary for the indigent sick where he remained until August 21, 1933, the date of admission to Beth Israel Hospital for total thyroidectomy. He made very gradual upward progress, and in June, 1935, was ready to accept a position which had to be postponed because of an acute infection necessitating intensive medical care. He believes total thyroidectomy helped him by reducing the rapid heart beats abolishing pain and increasing activity. Others who knew him felt the procedure had been worth while. (Class B)

Serial No 31, Unit No 19503 (rheumatic heart disease, congestive failure, mitral stenosis and insufficiency, auricular fibrillation)

A twenty-two year old American Jewish youth of inferior mental and personal make-up lives with his large discordant family group on marginal income supplemented at times by relief agencies. He never had a regular occupation, only working at odd laboring jobs occasionally.

Since March 1927 he had had several hospitalizations for his cardiac condition. Following total thyroidectomy on August 26, 1933, his health was improved. Finally, in June, 1935, after considerable difficulty in securing employment for this type of individual, he found work as porter in a doughnut bakery. He said his gains from the operation have been freedom from pain, sleep in recumbent position, ability to walk greater distances with no attacks of shortness of breath and generally greater activity. His family and he agree that with his improved condition he is emotionally much calmer and quarrels less with other members of his family. (Class A)

Serial No 32, Unit No 19404 (rheumatic heart disease, paroxysmal dyspnea, angina pectoris, paroxysmal auricular tachycardia, aortic regurgitation, mitral stenosis and regurgitation)

A twenty-one year old single American Catholic waiter lived at home with his widowed mother and six siblings. Bedridden for two years prior to total thyroidectomy on September 14, 1933, the patient had increased activity somewhat for twelve months following the operation. He was subjectively improved, could breathe more easily and lie in a recumbent position. For several months his family was greatly encouraged by his improved condition. The patient expired on September 1, 1934. (Class B)

Serial No 33, Unit No 19757 (arteriosclerotic and hypertensive heart disease, angina pectoris, diabetes mellitus, menopause)

This fifty-seven year old Russian Jewish housewife lives with her husband and four children on marginal income, worried about finances and a married daughter ill with tuberculosis.

She was extremely active until three years prior to operation when she developed cardiac symptoms. These gradually became more severe, incapacitating her for household duties and social activities. For two years preceding total thyroidectomy on September 29, 1933, she was a chronic invalid. Five months after operation the patient could do all her housework and participate in recreation. This continued for seven months until she suffered a recurrent anginal attack probably precipitated by overactivity and worry. Although restricting her ac-

tivities somewhat since then, nevertheless she has been doing considerable housework. The patient and family consider that the results of the operation have been phenomenal in her increased enjoyment of life and in the amount of work she accomplished with exceptional feeling of physical well-being. (Class A)

Serial No 35, Unit No 19802 (rheumatic and hypertensive heart disease, congestive failure, mitral stenosis and insufficiency, auricular fibrillation)

This forty-seven year old Russian Jewish housewife lives in a family group of husband, six children and two grandchildren. Their income is barely enough to meet the family's needs.

For seven years she had rheumatic heart disease with frequent congestive failure, bedridden for many weeks at a time. During these periods the patient and household were cared for by the family. For three months prior to operation on October 6, 1933, she was completely bedridden. For five months after total thyroidectomy, she assumed responsibility for the housework, marketing as well as participating in social activities. The patient and family were pleased with her improved physical condition and opportunity to live more normally. For the ten months following, however, she became progressively worse. The patient expired on April 18, 1935. (Class B)

Serial No 36, Unit No 1713 (hypertensive heart disease, congestive failure)

A thirty-eight year old Russian Jewish housewife lived with her husband, a painter, irregularly employed and four children. She was totally incapacitated for seven years prior to total thyroidectomy on October 7, 1933. Following operation her activity slightly increased but she was not able to assume household responsibility during the thirteen months she lived following the operation. The patient expired on November 14, 1934. (Class B)

Serial No 37, Unit No 19977 (arteriosclerotic and hypertensive heart disease, congestive failure, paroxysmal dyspnea, angina pectoris)

This sixty-three year old Roumanian Jewish man lives with his wife at the home of a married daughter on whom he is dependent for support.

Until his first heart attack three years prior to total thyroidectomy, he was steadily employed as an insurance salesman and actively interested in communal affairs. Since July 1933, illness had gradually incapacitated him and he was bedridden up to time of total thyroidectomy, November 4, 1933. The patient believed that the results of operation were relief from pain and easier breathing for six months after which he was completely bedridden and considered his general condition worse. The family stated that formerly a cheerful, optimistic individual he had become depressed and fault-finding. His private physician felt that the patient's discouragement was a natural outcome of the chronicity of his condition. (Class C)

Serial No 39, Unit No 20102 (rheumatic heart disease, congestive failure, paroxysmal dyspnea, angina pectoris, mitral stenosis and insufficiency, auricular fibrillation, pulmonary emphysema)

A fifty-year old Russian Jewish housewife lived with her unemployed husband and two children in a second floor flat supported by public welfare aid. Recurrently incapacitated for ten years and totally incapacitated for six months she lived twelve months following her total thyroidectomy on November 20, 1933, during which she had no increase over pre-operative activity. (Class C)

ectomy he resumed his former occupation. His time is divided between work at the office and his hobby of horticulture. The patient stated that the operation had been unquestionably successful, as he has had no heart attacks. His family are encouraged by improvement in his health and his private physician credits the operation with having already added a year of active life. (Class A)

Serial No 62 Unit No 21832 (arteriosclerotic heart disease angina pectoris paroxysmal dyspnea)

A sixty-seven year old Russian Jewish man financially independent lived in a small heated apartment with his wife. The patient's cardiac illness forced him to give up his business four years prior to total thyroidectomy. For three months before admission he was in bed most of the time. For the summer months following total thyroidectomy on April 5, 1934 the patient was more active than prior to operation. However he became progressively worse and since February, 1935, had been bedridden with lavatory privileges only. He stated that the operation continued to relieve cardiac pain also that postoperative weakness was easier to bear than preoperative pain. His wife felt that the patient was worse after operation. Private physicians believed that total thyroidectomy had not really benefited the patient because of the development of cardiac decompensation and slowness of mental responses. Because of an unharmonious domestic situation it has been exceedingly difficult to evaluate correctly the results of this operation. The patient expired on May 27, 1935. (Class C)

Serial No 63 Unit No 13871 (rheumatic heart disease congestive failure mitral stenosis auricular fibrillation)

This forty-five year old Russian Jewish housewife lives at home with her husband and three minor children. The family is dependent on welfare aid. Her husband an upholsterer by trade is unable to work because of gastric ulcer but assumes responsibility for the household.

For eleven years the patient was treated for rheumatic heart disease which gradually incapacitated her until she became bedridden for about two years prior to total thyroidectomy on April 12, 1934. Immediately following the operation her condition improved and for four months she could do light housework. During this period the household strain was so relieved and the family was so greatly encouraged that the oldest daughter felt free to leave home to marry and live in another state. Although the patient's condition has recently grown worse and she has become completely bedridden again she has less pain and can breathe more easily. (Class B)

Serial No 64 Unit No 21877 (arteriosclerotic and hypertensive heart disease congestive failure paroxysmal dyspnea hernia)

This patient is a fifty-eight year old Russian Jewish blacksmith whose activities were restricted by cardiac disease for six years during the last two of which he was almost totally incapacitated prior to total thyroidectomy on April 16, 1934. Two devoted adult children have assumed responsibility for support of the household. Since operation the patient has been free of pain can lie comfortably and breathe easily. His general activity has increased somewhat. He developed a psychosis about three months after operation necessitating treatment in a mental hospital. The family believes that his general physical condition has improved. (Class B)

Serial No 65, Unit No 16680 (rheumatic heart disease congestive failure angina pectoris paroxysmal dyspnea, mitral stenosis)

A thirty-six year old Polish Jewish housewife with husband and three children share a flat with her mother and epileptic brother. The household income is derived from the mother's small grocery store and earnings of the husband a presser irregularly employed in a knitting mill.

The patient's cardiac illness of six years duration was complicated by asthma for three years causing frequent incapacity. During these periods, the patient and household were cared for by the mother and oldest child a schoolgirl of fifteen. For five months prior to total thyroidectomy on April 20, 1934 she was completely bedridden. For a three months period following operation her condition improved enabling her to assist with the housework and in her mother's store. In January, 1935 she developed pneumonia and has done less work since. The patient states that the operation has helped her by freedom from asthmatic attacks and pain and permitted greater activity. Members of the family feel relieved of anxiety for the patient. (Class A)

Serial No 68 Unit No 22182 (arteriosclerotic and hypertensive heart disease angina pectoris diabetes mellitus)

This fifty-seven year old Russian Jewish housewife lives at home with her husband, son and the family of a married daughter. The family is independent financially and has provided nursing care for the patient when necessary.

Four years prior to total thyroidectomy, the patient was well and active until her first anginal attack which increased with frequency requiring bed care for months at a time and finally incapacitating her entirely. The daughter became responsible for the care of the patient and the home. Three months after total thyroidectomy on May 17, 1934 the patient gradually became more active doing light housework and living a normal social life. In April 1935 however she suffered an acute exacerbation following two weeks of overactivity caring for the household during her married daughter's illness. The patient's family and private physician feel that total thyroidectomy has greatly reduced the number and severity of attacks and has afforded the patient greater variety and amount of activity. She herself feels she has become a useful member of society again. (Class A)

Serial No 71 Unit No 20941 (arteriosclerotic and hypertensive heart disease angina pectoris)

This patient is a fifty-seven year old Russian Jewish housewife living with her husband, son, daughter and granddaughter. They are independent financially and own the house in which they live. Except for its location on a high hill with many steps leading to it home conditions including family relationships are good and adequate for the patient's needs.

For eight years prior to total thyroidectomy on June 8, 1934 the patient's physical condition increasingly incapacitated her so that other members of the household had to assume responsibility for her duties. Neither was she able to participate in any recreation outside the home. Within three months after operation she did all the cooking and baking and within ten months had been able to undertake and enjoy social life in the community. (Class A)

Serial No 72 Unit No 22698 (rheumatic heart disease congestive failure mitral stenosis)

This thirty-year old American Jewish single commercial artist lived at home with her family. They were able financially to provide the patient with all her needs. She had been permitted only irregular

cally unemployed because of cardiac illness since the latter date he has been continuously unemployed and dependent on the community for support. Six months prior to total thyroidectomy on January 2, 1934, he was practically bedridden at home. Following operation, although he is unable to work because of general weakness, he and his wife state he carries on more general activity with less pain. His wife commented with great satisfaction on the patient's increased emotional stability (Class B).

Serial No 50 Unit No 20905 (arteriosclerotic heart disease, angina pectoris)

A fifty three year old Russian Jewish man lives at home with his wife and two grown sons. His children are supporting the household with difficulty.

The patient had formerly earned a good living as a merchant. About a month prior to operation on January 16, 1934 he was obliged to give up work because of the frequency of anginal attacks. He feels that total thyroidectomy did not lessen frequency of the attacks. His wife, relatives and private physician believe that physically he has not improved and emotionally he is more irritable and unstable (Class C).

Serial No 51 Unit No 20975 (congenital heart disease congestive failure paroxysmal dyspnea)

Cardiac illness of nine years' duration caused this thirty-one year old single Russian Jewess to abandon three attempted careers. She had always been an extremely active individual.

At the time of total thyroidectomy on January 17, 1934 she was a student preparing for an executive position but the strenuous nature of the work necessitated discontinuance of this plan. Following total thyroidectomy, after several months in search of work, the patient finally secured and continued employment as clerk despite considerable difficulty in adaptation to the job. On excessive physical or emotional strain she continued to have some precordial pain. The ability to carry on without interruption a fulltime position and the pleasure derived from new social contacts gave her great satisfaction and a new sense of security (Class A).

Serial No 52 Unit No 21117 (rheumatic heart disease congestive failure)

A thirty four year old Lithuanian Jewish merchant lives in a first floor flat with his wife and three minor children.

For one and one-half years prior to total thyroidectomy on January 26, 1934 he was unemployed periodically because of cardiac illness which drained the family finances to the point where they reluctantly applied for public aid in June 1934. Following total thyroidectomy the patient's gradually increasing physical improvement had a stabilizing influence on his emotional reactions. In April 1935 he resumed fulltime his usual occupation which required considerable physical exertion. The patient and family are gratified that operation re-established his lost independent economic and social status (Class A).

Serial No 54 Unit No 21190 (rheumatic heart disease congestive failure)

This fifty year old Russian Jewish housewife lives at home with her husband a rabbi in moderate financial circumstances.

Because of the patient's cardiac illness which incapacitated her twelve years prior to total thyroidectomy responsibility for the household had to be assumed by her daughter-in-law. Since total thyroidectomy on February 15, 1934 the patient's health has been excellent and she has taken over

the management of her household, a maid assisting with the heavy work. Her son and daughter-in-law have been able to establish their own home. She has been living an active life, taking a vital and responsible part in numerous charitable and communal organizations. The patient and husband are elated with the complete change in her way of life. Her family physician considered the operation a phenomenal success (Class A).

Serial No 56 Unit No 16645 (rheumatic and hypertensive heart disease congestive failure paroxysmal dyspnea mitral stenosis and insufficiency aortic stenosis and insufficiency)

This fifty four year old Russian Jewish housewife lives at home with husband and three daughters who intermittently employed, support and manage the household.

The patient's cardiac illness dating from 1916 became severe in November 1932. From December, 1933 until total thyroidectomy on February 17, 1934 she was confined to her bed. During the summer of 1934, she was able to carry on some activity. The family private physician and patient feel that she was beginning to show some real improvement until the sudden death of her youngest daughter in October 1934, when she became practically bedridden again (Class C).

Serial No 58, Unit No 22822 (arteriosclerotic and hypertensive heart disease angina pectoris gout)

A forty two year old single Russian Jewish sales man, living at the home of relatives, was in good health and very active in business and social life until January, 1932, when he developed anginal attacks. Since May, 1932, he was unemployed because of ill health but his small income affords him financial independence. Since total thyroidectomy on February 26, 1934, the patient has continued to live a life of limited activity spending the winter months in Florida. Though he has at tempted no work since operation he feels that total thyroidectomy has been a definite help in relief of pain and increased comfort. (Class B)

Serial No 59 Unit No 21469 (rheumatic heart disease congestive failure paroxysmal dyspnea aortic and mitral stenosis and regurgitation)

Rheumatic fever in 1920, followed by cardiac symptoms in 1928 had finally incapacitated this twenty nine year old single American Jewish laboratory technician for work in 1931. From that time until total thyroidectomy on March 3, 1934, he was a bedridden invalid with very poor prognosis. He was discouraged, easily excitable and quick tempered. Following total thyroidectomy he has had slowly increasing activity, but has not yet resumed employment. The patient and family state that the operation has relieved persistent coughing pain and made possible sleep in a recumbent position. His private physician said that the changes from the preoperative picture are amazing and can only very poorly be expressed verbally. From one who considered himself an hopeless invalid awaiting death and even attempting suicide he now feels he is definitely on the road to a normal life (Class B).

Serial No 61 Unit No 21779 (arteriosclerotic heart disease angina pectoris)

A sixty four year old American Protestant widower, whose children are married lives on a moderate income in a bungalow cared for by a housekeeper.

Four months prior to total thyroidectomy on March 27, 1934 because of anginal attacks the patient gave up his employment as secretary of a large business. Three months after total thyroid

- b Resumption *usual* occupation
  - (1) Length of time between thyroidectomy and this work
  - (2) Describe the work and effort involved
  - (3) Length of time carried on
- c Nature present occupation (if different from usual occupation)
- d If unemployed state reason
  - (1) Patient's physical condition, or
  - (2) General economic situation

For Housewife

- Has patient less distress?
- Is patient without periods of decompensation?
- Are periods between incapacity longer?
- Can patient do more?

B General or extra-occupational activity

- 1 Prior to thyroidectomy
  - a Daily activity (in detail—hour by hour, if necessary)
  - b Stair climbing—no stairs—no times climbed daily
  - c Walking care of stove or furnace shoveling coal carrying heavy bundles, lifting children, etc
- 2 Following thyroidectomy
  - a. Daily activity (in detail—hour by hour if necessary)
  - b Stair climbing—no stairs—no times climbed daily
  - c Walking, care of stove or furnace shoveling coal, carrying heavy bundles lifting children etc

C Recreational activity

- 1 Describe active habitual recreation (dancing long distance walks tennis golf riding bowling etc)
- 2 Passive habitual recreation (reading music movies radio motor riding)

D Relationship between activity (as above) and recurrence of attacks (if any)

E Comparative statement of time element in performance of usual tasks before and after thyroidectomy

- 1 Effect on patient's disposition and personality

III Significance of Patient's Illness to

- A. Patient
- B Family
- C Associates

IV Economic Evaluation of Patient's Illness to

- A Patient
  - 1 Dependency on family, friends and others
- B Patient's family
  - 1 Dependency on relatives friends and others
- C Society
  - 1 Community expenditure for patient's support and medical care
    - a Public relief
    - b Private relief
    - c Hospital nursing and convalescent homes (if possible estimate doctors fees and medication)
  - 2 Loss of income and productivity if possible to ascertain

V Evaluation of Total Ablation of Thyroid as Treatment from point of view of

- A Patient
- B Family
- C Associates

VI Social Worker's Estimate of Gain to Patient in Overcoming Handicap for Normal Social Life

List persons interviewed giving estimate of reliability

employment from December, 1933 to March 1934, because of her cardiac illness and no employment at all from that time until June 9 1934 the date of total thyroidectomy. For two weeks prior to operation she was in very poor condition and confined to her bed. After total thyroidectomy the patient gradually increased her activity until August, 1934 and for about two months following she was able to live an active social life and enjoy a vacation away from home. After this she became weaker and spent much of the time in bed. However, the patient was hopeful that she would regain her strength and resume activity. At time of interview (May 1935), she and the family felt that the operation relieved her physical discomfort and granted her a few months of happy, normal activity and prolonged her life for about a year. She expired on July 12, 1935 (Class B).

Serial No 73, Unit No 22788 (arteriosclerotic heart disease angina pectoris hypertrophied prostate epidermophytosis pulmonary emphysema). A fifty five year old Austrian Jewish business man developed cardiac illness nine years prior to total thyroidectomy but was active in business and communal affairs with only brief periods of incapacity until two months preceding total thyroidectomy on June 19 1934, when he became bedridden. Following operation, the patient has slowly regained his activity. Is now able to be present at business a few hours daily drive his car and take part in a limited social program. The patient feels that total thyroidectomy has relieved his pain and increased his activity. His family physician believes that the patient is more active than he himself appreciates and considers that total thyroidectomy has greatly improved the patient's general condition (Class A).

## APPENDIX 2

## SOCIAL STUDY OF CARDIAC PATIENTS FOLLOWING TOTAL ABLATION OF THYROID

by

Social Service Department Beth Israel Hospital

Name				Unit #
				OPD #
Address				SS #
Age	Color	S M W Div Sep	Religion	Date of Total Ablation of Thyroid Gland
Diagnosis				
Dates of All Hospital Admissions Including B I H (admissions for cardiac condition in red, others in black)				
Hospital				Admitted Discharged
Persons Interviewed				

## Brief Statement of Patient in his Social Setting at Time of Study

## I Patient's Personal History

## A Prior to thyroidectomy

- 1 Educational
- 2 Health (picture of periods of cardiac incapacity—patient's own idea of health)
- 3 Occupational
- 4 Economic
- 5 Personality
- 6 Patient's attitude toward
  - a Cardiac condition
  - b Life in general

## B Following thyroidectomy

- 1 Health
- 2 Occupational
- 3 Economic
- 4 Changes in personality since operation
- 5 Patient's attitude toward
  - a Cardiac condition
  - b Thyroidectomy and its results for patient

## II Study of Patient's Activity

## A Occupational

- 1 Prior to thyroidectomy
  - a Name usual occupation
  - b Describe processes involved
  - c Duration of unemployment due to illness
    - (1) Periodic or
    - (2) Continuous over period of months or years
- 2 Following thyroidectomy
  - a First work of any kind after thyroidectomy
    - (1) Length of time after thyroidectomy and this work
    - (2) Describe the work and effort involved
    - (3) Length of time carried on

There is nothing unusual about this case. In fact, every doctor sees such cases frequently in his practice. Many are treated with soda and carminatives procedures which may cause the expulsion of gas but do not relieve the underlying condition which is spasm in an irritated bowel.

#### CASE 2

A forty-seven year old woman of nervous temperament ate sausages for dinner and two hours later felt nauseated. She did not complain of pain. She said that she felt as if her stomach were tied in a knot. She complained of numbness and prostration and felt so ill that she became very much frightened. Physical examination revealed normal conditions except for considerable distention in the epigastrium. On auscultation no sounds were heard during a period of two minutes. She was given 1/50 of a grain of atropine and a grain and a half of phenobarbital. In ten minutes she complained of dryness of the mouth. In twenty minutes she said she was feeling better and in half an hour she was comfortable. Fifteen minutes after the administration of the medicines peristalsis was audible. This became more pronounced in the next few minutes.

What was the condition here? It seems reasonable to suppose that there was an intense spasm so severe that it completely stopped peristalsis. When the spasm was relieved rapid peristalsis began because the bowel was still in an irritable state. Probably in most cases of indigestion a greater or lesser degree of spasm is the cause of pain, gas and distention. Hypermotility alone may not cause discomfort. This point is however open to question. It seems to be the rule that when a considerable amount of gas collects in the stomach due to spasm at the pylorus causing severe pain and distention no sounds are heard.

The writer does not feel that this patient would have been benefited by sodium bicarbonate, carminatives or enemas. Of course with no treatment at all the spasm would have subsided and the intestine would have regained its normal function but the patient would have spent an uncomfortable night. Cases of hypermotility that do not improve in a few days with sedatives should be carefully examined as pathological conditions such as chronic appendicitis, cholelithiasis, ulcer and carcinoma should be suspected. Usually functional nervous indigestion responds very quickly to medication and a bland diet.

#### ALCOHOLISM

Alcoholism seems invariably to cause hypermotility. Depending on their temperaments people react differently to alcohol. The stolid phlegmatic type can tolerate much larger doses than the high-strung sensitive type. In the latter group even moderate daily amounts of alcohol will cause hypermotility in time. Some people seem to become sensitized to it and even after several weeks of total abstinence a small amount will cause spasm and hypermotility.

The abdominal discomfort experienced the morning after an attack is possibly due to the hypermotility because the condition is rather quickly allayed by doses of phenobarbital.

#### MORPHINE

It is almost the universal practice to give morphine to lessen peristaltic activity. Three morphine addicts who have been taking the drug over a period of several years have continuous peristalsis most of the time. A year ago the writer was obliged to take 1/6 of a grain of morphine and in this instance peristalsis began to be active fifteen minutes after administration of the drug.

#### CASE 3

A woman aged fifty-five years entered the hospital with a gastric hemorrhage. She was under the care of a surgeon who gave her 1/6 of a grain of morphine every three hours for four doses. When first seen the peristaltic rate was apparently normal. Fourteen hours later it was increased to about twenty-five gurgles per minute.

Certainly the morphine had not accomplished its intended purpose in this case. In about twenty other cases the writer has noted the same response to morphine.

Sollmann<sup>2</sup> states that morphine causes a pyloric spasm of the stomach with also apparently a tendency to irritation of the intestine. Recent proof that morphine stimulates rather than quiets peristalsis has been shown by Yonkman<sup>2</sup> and his co-workers. It is well known that some women cannot tolerate morphine. Most of these women belong to the high-strung sensitive group and then intolerance may be due to the exaggerated peristalsis and spasm which morphine produces. Accepting the above data indicating that morphine increases the activity of the bowel makes one question whether it will continue to be accepted as good practice to give it in cases of postoperative distention or gastric and intestinal hemorrhage. A number of surgeons have told me that they were not satisfied with the effect of morphine in cases of postoperative distention although they have never listened to the abdomen to determine the existing condition.

#### EARLY VOMITING OF PREGNANCY

After conception a rather profound change takes place in the physiology of the body probably associated with a temporary imbalance of the activity of the endocrine glands. A period of weeks is required in some cases to effect a readjustment. In this readjustment it is possible that the sympathetic nervous system is abnormally stimulated. This in turn causes a functional disturbance of the gastro-intestinal tract. The degree of disturbance seems to depend somewhat on the temperament of the individual. Usually the more the individual is of

## AUSCULTATION OF THE ABDOMEN\*

BY NEIL C STEVENS, M D †

CANNON<sup>1</sup> in 1905 stated, "In such disorders as gastritis, nervous dyspepsia, atony, colic, peritonitis and dysentery, a study of the sounds produced by the movements of the alimentary canal both before and after the administration of drugs, may reveal facts important to the clinician." Auscultation of the abdomen is extremely simple. It is no more difficult to determine the peristaltic rate than to count the pulse rate but, in spite of the intense and life long study of the sounds produced in the heart and lungs by physicians during their professional lives, intestinal sounds are very seldom studied by many physicians and never by most. Such studies may record the rate of sounds heard and also the volume and pitch. In this work the author has paid attention especially to the rate. Such study gives an idea of the condition of intestinal peristalsis in "nervous indigestion", acute alcoholism, cyclic vomiting of childhood, vomiting of pregnancy, postoperative distention, intestinal obstruction, acute appendicitis and peritonitis. The peristaltic rate can also be studied by the fluoroscope.

The normal rate of peristalsis varies with the time of day and becomes more active after each meal. After the stimulating effect of the meal has passed away the normal rate is between five and ten tinkles per minute. Under conditions of hypermotility this may go as high as fifty or even become a continuous gurgle. Also during hypermotility the normal high-pitched tinkle shifts to a harsh and low-pitched gurgle. With practice, the distinction between normal and abnormal sounds becomes easy of recognition.

The sounds produced in the stomach are higher pitched than those produced in the intestine. Cannon stated that more sounds are heard over the active ascending and transverse colon than over the descending colon. He states further "The evidence that the rhythmic sounds audible over the pyloric region are due to the rhythmic recurrence of peristaltic waves moving up to the pylorus has been presented in a comparison of the conditions in man and in the cat. This evidence is confirmed by observations of Moritz on himself. He introduced a stomach tube into the pyloric end of his stomach and found that there were rhythmic oscillations of the intragastric pressure in that region. Examination of his records proves that the rate of gastric peristalsis, in his case is

approximately three waves per minute.' His estimate is that four waves per minute occurred in the stomach of the cat and dog and five waves per minute in man. He found that the intestinal peristalsis was slightly more rapid, eight to ten waves per minute.

Hypermotility is commonly but not always found in the following conditions:

## Functional

- 1 "Nervous indigestion"
- 2 Acute alcoholism
- 3 Morphinism
- 4 Spastic constipation
- 5 Early vomiting of pregnancy
- 6 Cyclic vomiting in children
- 7 Hereditary nervous disorders in children
- 8 Malnutrition and indigestion in children

## Organic

- 1 Peptic ulcer
- 2 Carcinoma of the stomach
- 3 Gallbladder disease
- 4 Early acute appendicitis
- 5 Early intestinal obstruction
- 6 Occasionally, colonic occlusion
- 7 Occasionally, postoperative distention
- 8 Occasionally, right lower lobe pneumonia in children

Absence of sounds is found in the following conditions:

## Functional

- 1 Occasionally, acute indigestion accompanied by severe spasm

## Organic

- 1 Peritonitis
- 2 Late intestinal obstruction

## NERVOUS INDIGESTION

## Case 1

A woman aged forty five complained of sudden severe pain in the region of her heart. She had had many of these attacks before and was convinced that she had heart trouble. The pain was over the apex of the heart and radiated to the left axilla. On examination the heart and lungs were found normal. There was no dyspnea and it was evident that she was not suffering from cardiac distress. The pulse rate was rapid but regular and the increase in rate was in all probability due to fear. There was continuous peristalsis. A grain and a half of phenobarbital with 1/100 of a grain of atropine sulphate was given. She was told to repeat this if necessary. The hyperperistalsis ceased after five hours and she had no heart attacks during the following two months while she continued to take daily doses of phenobarbital.

\*Read before the Staff Meeting of the Boston Dispensary, February 16, 1937.

†Stevens, Neil C—For record and address of author see This Week's Issue, page 4.



the method of auscultation in cases of suspected appendicitis

No case of acute appendicitis has yet been encountered with a noisy abdomen except after the administration of a purge or the giving of an enema. There are many cases of acute indigestion which simulate appendicitis very closely and many cases have been operated on for this condition and a perfectly innocent appendix found at operation. There is pain and tenderness in the right lower quadrant and due to the pain or distention the abdomen is held more rigidly on the right. This is often confused with true rigidity. There may be a slight rise in temperature and pulse rate. Vomiting is common. The changes in blood count may be indefinite. These cases of acute indigestion are nearly always accompanied by active peristalsis. In a few there is such an intense initial spasm that sounds may be absent entirely, but the administration of 1/100 or 1/50 grain of atropine will quickly eliminate the spasm.

Auscultation is useless when an enema or salts have been given, as it is difficult to distinguish the gurgling of fluid from peristalsis.

#### CASE 4

A man aged twenty-five, was sent into the hospital with a diagnosis of acute appendicitis. He complained of intense pain in the right lower quadrant. The pain lasted about four hours and was intermittently severe although there was some pain present all the time. This patient had vomited twice. The temperature was 100° the pulse 95. The tongue was slightly coated. There was tenderness and slight spasm in the right lower quadrant. The blood count was 12,000 with 82 per cent polynuclears. There was active peristalsis. This case was diagnosed as acute appendicitis by the surgeon in charge but a normal appendix was found at operation.

In this instance there were two things against the diagnosis of acute appendicitis, first, intermittent pain which is not characteristic, and, secondly the presence of active peristalsis. The blood count was of no help, it might be classed as borderline. At the beginning of an acute attack of appendicitis the peristaltic rate is often increased.

#### CASE 5

A man aged forty-two complained of pain in the epigastrium. He felt nauseated but had not vomited at the time which was about 5 p.m. There was no marked tenderness over the appendix. Peristalsis was rather active. The temperature was scarcely 99°. This patient knew a great deal about the symptoms of appendicitis and was quite worried about himself. He told me he thought he was going to have an attack. I informed him that I saw no evidence of it then. Six hours later he called me again and said the pain was more general and more severe. At that time there was tenderness and slight rigidity over the appendix region. A blood count showed a definite increase in the white blood cells and polynuclears. The abdomen was almost silent. He was operated on three or four hours later and an acutely inflamed appendix was found.

Since the writer's first article on this subject in 1931, he has received enough confirmatory evidence from surgeons to permit him to say that when there is steadily increasing pain in the right lower quadrant with more or less rigidity, and with a decreasing peristaltic rate, the probability that one is dealing with an inflammatory condition is strong.

#### POSTOPERATIVE DISTENTION

Cannon<sup>1</sup> in 1906 said, "After handling the intestine somewhat severely in the air there was no discharge from the stomach for more than three hours, but the intestine was not handled after the discharge from the stomach began. The exit of the food was extraordinarily slow at the end of seven hours only as much had departed as ordinarily goes out in one half hour."

So, then, in the hours immediately following operation there is a paralysis of the gut. As far as the writer knows there is no accurate knowledge as to how long the paralysis lasts following operation. Distention does not usually occur until twenty-four to thirty-six hours. At that time peristalsis usually becomes audible. There is then an initial paralysis followed by hypermotility and spasm sooner or later. On the whole, surgeons have failed to realize that there are two phases, one of shock and the other of overstimulation.

#### CASE 6

A woman aged fifty-five was sent into the hospital for gastric hemorrhage. The x-ray diagnosis was duodenal ulcer. Gastro-enterostomy was performed and for the first two days after operation her condition was good. On the third day she became slightly distended, began to vomit, and for the next four days vomited continuously. The usual treatments for this condition were tried without effect. On the fifth day she was given a large dose of sodium luminal subcutaneously and this was followed at twelve hour intervals by 2 grains of the same drug. Grain 1/100 of atropine sulphate was given three times a day for three days. In the last two weeks the patient has vomited three times. She is retaining her food, is recovering rapidly and able to sit on a chair.

It is the writer's conviction that if phenobarbital were given immediately following an abdominal operation and its administration kept up for two or three days postoperative distention would cease to be such a cause of alarm and trouble to surgeons. It does not seem reasonable to treat the stage of irritability of the intestine with morphine, pituitrin, turpentine stupes, or high colon irrigations.

#### THE DIFFERENTIAL DIAGNOSIS BETWEEN RIGHT LOWER LOBE PNEUMONIA AND ACUTE APPENDICITIS

#### CASE 7

A boy eight years of age who complained of pain in the right side of the abdomen had vomited twice. The temperature was 103° F. the pulse 130. The right side of the abdomen was rigid and there was



the high tension type, the more marked will be the disturbance.

Two cases of early vomiting of pregnancy came into the Glen Cove Hospital at about the same time. One had been vomiting for a period of three weeks almost constantly and had lost twenty pounds in weight. The other had been vomiting for about two weeks and had lost fifteen pounds in weight. Both these women had been under considerable nerve strain. The physical and laboratory examinations were negative except for the presence of acetone in the urine. In both cases peristalsis was extremely active.

The writer did not see these cases until they had been in the hospital for several days. During this time they had been treated in the usual manner with fluids and glucose. The improvement had been slight, if any. Then five grains of sodium luminal was given intramuscularly to each patient, with three doses of 1/100 grain of atropine sulphate. The second day four grains of sodium luminal were given, thereafter 1/2 grain three times a day for several days. During the remainder of their stay in the hospital one grain to 1/2 grain a day was given without other medication. Vomiting stopped in both cases on the second day and the ability to retain food returned. Then weight had returned almost to normal when they left the hospital.

In the severe cases there is probably considerable spasm accompanying the hypermotility. This spasm is resistant even to large doses of phenobarbital. Atropine seems to be necessary. There were eighteen other cases in this group, but none of them were severe enough to require hospital treatment. The chief complaints of most of them were nausea and morning vomiting. These were controlled very easily by phenobarbital. This drug has been used rather frequently in this condition, but not in large enough doses to quiet the intestinal activity. The writer has noted that when the intestinal activity diminishes the nausea and vomiting cease.

#### CYCLIC VOMITING IN CHILDREN

Six cases only of cyclic vomiting have been studied but these were so similar in their history, symptomatology, physical findings and response to treatment, that one may be hopeful that the underlying principle in these cases will hold true in a much larger group. All six children were between the ages of three and eight years at the time they were seen. All were nervous, and at least one parent of each child, except in one family, gave evidence of nervous instability. In the case of the one exception both parents were heavy drinkers and had been for several years preceding the birth of the child. The symptomatology was very much alike: vomiting once or twice a month, sometimes oftener, usually precipitated by fatigue, nervous tan-

trums or the consumption of indigestible food. The physical findings were negative except that every patient was below normal weight. During prolonged attacks, acetone was present in the urine. Marked and persistent hypermotility of the bowel was the physical finding common to all. One of these cases, a boy four years of age, did not improve under treatment. It was not until a pair of large diseased tonsils were removed that he began to improve. For the past two years his vomiting has practically ceased. Another patient, a girl of six years of age, had never been in good health. Her mother could not remember when she did not have periodic attacks of vomiting. When first seen she was a pale, asthenic child, eleven pounds under weight. She had an attack of vomiting about once a month, occasionally at shorter intervals, that lasted about three days causing extreme weakness and requiring another two days' rest in bed to regain her strength. Physical examination was negative except for very active peristalsis. She had been under the care of a pediatrician in New York for the previous three years. He had unsuccessfully tried many diets. She was seen during an attack of vomiting. A grain of sodium luminal was given intramuscularly. Thereafter she was given about 1/3 of a grain of phenobarbital by mouth three times a day for three days. Then the dose was reduced to 1/4 of a grain. This was continued for a week and at intervals during the next six months. On only a few occasions since then has she had any of the drug. The child has had no attacks for three years, except one following "grippe." Up to a year ago she had gained fifteen pounds in weight, was going to school, played games and was apparently a normal child.

#### MISCELLANEOUS ORGANIC CONDITIONS

It is well known to all roentgenologists that hypermotility is usually associated with gastric and duodenal ulcer, cholelithiasis and some times with carcinoma of the stomach and chronic appendicitis. Very often hypermotility is present in acute infections. Active peristalsis has been observed in cases of lower lobe pneumonia in children. This finding may in some cases help to differentiate pneumonia involving the right lower lobe, and acute appendicitis.

#### ACUTE APPENDICITIS

During the period of very acute inflammation at an undetermined time before rupture, peristalsis ceases altogether, and the abdomen becomes silent. All surgeons recognize the silent abdomen of peritonitis. However in the early stages of acute appendicitis, peristalsis is usually present. As the inflammation increases in severity the peristalsis diminishes. This observation has been verified by a number of surgeons whom the writer has asked to employ

I am neither a Holmes nor a Webster nor would I attempt to place my theories on record. I make no statement about the future of medicine which may be as unexpected and as unbelievable as would have been a prediction of its present state to the men of the seventies and eighties of the last century. What was new to them is an old story to us. What we know may be and not improbably will be obsolete fifty years hence but that is no reason for being faint of heart or for relaxing in our efforts to be each in his own place, the exponent of the best in medicine as it is now known. I did once think myself a surgeon and for forty years played with knives. To me the time does not seem so altogether remote when I studied medicine in the old North Bennet Street Medical School in Boston and served as House Officer in the Boston City Hospital. The man who began ten years behind me is however a man of another era for between 1874 when I entered the medical school and 1884, there was a great gap—a gap which separated a surgery that must to one unacquainted with it seem medieval from one that was at least relatively modern.

In 1874 there was but one trained nurse in New England. Henry J. Bigelow operated in the amphitheatre of the Massachusetts General Hospital. He would theatrically stride across the back of the scene remove his driving gloves as he entered, and then pass from the sight of the assembled students. He would quickly reappear clad in that old frock coat, daubed with pus and other more objectionable excretions stiff with clotted blood and filthy beyond measure ready with unwashed hands to seize the unsterilized knife and begin one of those dextrous operations for which he was famous. Oliver Wendell Holmes taught anatomy at the top of the steepest flight of stairs that ever the mind of architect conceived. Or, rather he taught at the bottom of the pit to the top of which those stairs led and to which one descended in the midst of a mighty hurly-burly, after one had achieved the perilous ascent and the door had been suddenly opened from within by unseen hands. As someone said "The lectures were interesting but was it anatomy?"

In 1877, fourteen men presented themselves as candidates for the position of interne before a dreadful circle of eminent physicians and surgeons in the waiting room of the City Hospital. For an hour and a half we answered questions more or less accurately and from our number four were selected. I was lucky enough to be one of the four, and in short order began as externe interne my eighteen months service. Every day after work in the Outpatient Department as externe I went to the 'house' and was confronted with a row of phials filled with urine which when examined

and reported on ended my day's work. When I began my duties as interne there was still no trained nurse in the hospital. The house officer though not condemned as at the Massachusetts General to be known as house pupil of course abbreviated into house pup still led more or less of a dog's life. Besides the daily round of dressings—and in those days practically every wound must be dressed daily for all were bathed in pus from beginning to end of treatment—he also took all temperatures passed all catheters on both males and females night and day pulled the teeth of those who thought proper to finish a debauch by demanding this service at unearthly hours and even in some cases gave the enemas to male patients. Secondary hemorrhages were the bane of his existence. Hanging on the bed of every amputation case was a tourniquet and at the call of patient or nurse it was a race between death and the house officer the latter too often a poor second. Arteries were tied with silk one end cut short the other left long to protrude with its neighbors through one corner of the sewed flap so that in due time as suppurating tissues became weak, they cut loose. They could then one by one be gently pulled and finally removed. Everything swam in pus. We even had at one time so much hospital gangrene that all operations were suspended for several weeks because to cut a man meant to kill him. A compound fracture of an extremity it due to direct violence always suggested and was often treated by immediate amputation so frequently did septic poison otherwise claim the patient. Septicemia and pyemia were always to be found somewhere in the hospital.

I saw during my service the first ovariectomy in a public hospital in Boston done by Dr. Field, assisted by Dr. Cheever. Great was the former's joy at the patient's temporary recovery—joy eclipsed when peritonitis claimed its victim a few days later. Dr. John Homans had, of course been operating for some time but not in a public hospital. Always remember that these ovariectomies were done on large cysts which filling the abdominal cavity lay close against the anterior abdominal wall. No one would have thought of interference when the abdominal contents must be exposed and handled. The peritoneum was a *noli me tangere*, naturally, for one does not hunger for fatal results. I well remember giving by order 72 grams of opium in a single day as the only available measure in a penetrating wound of the abdomen the patient dying *placide et jocunde*.

One of the most vivid of my memories is that of the astonishment with which I saw Lord Lister in London in 1881 operate on an old hernia dissect out the sac sew the sides together and cut off the redundant portion. Cut it off! Good

tenderness in the right upper quadrant The white count was high, 20 000 with 90 per cent polynuclear leukocytosis An x-ray of the chest was inconclusive The differential diagnosis rested between right lower lobe pneumonia and acute appendicitis There was active peristalsis

A diagnosis of right lower lobe pneumonia was made which proved to be correct In the differential diagnosis of this condition the blood count is of no value except in cases of pneumonia with marked leukocytosis

I have seen a few cases of pneumonia in children where peristalsis at the moment of auscultation was apparently normal It is only significant when peristalsis is active The writer has yet to observe a case of acute appendicitis with a noisy abdomen

#### SUMMARY

- 1 Since it is possible to demonstrate a normal peristaltic rate, any departure from the normal seems worthy of investigation
- 2 The peristaltic rate is accelerated in cases of nervous indigestion, acute alcoholism, in

some cases following the administration of morphine, in the early vomiting of pregnancy and in some cases of cyclic vomiting of children

- 3 Peristalsis is absent in peritonitis and at an undetermined time before rupture in acute appendicitis

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## ADDRESS AT ANNUAL MEETING OF THE BOSTON CITY HOSPITAL ALUMNI ASSOCIATION\*

BY SAMUEL B WOODWARD M D

WHEN your genial toastmaster, in answer to my letter of inquiry as to the reason why the old "grads" were charged more for this dinner than were the younger men told me it was because there were free cocktails and the veterans had no natural limit I decided to come down and try my luck, and when he said that if I did he intended to use me as a stopgap between two of the speakers of the evening, I told him that nothing would prevent my appearance

When one has received the ignominious honor of being placed on the consulting staffs of several hospitals—consulting staffs with which no one has for many a long year consulted or ever thought of consulting—and placed on the shelf—*medicus obliteratus et oblitus*—it pleases mightily the corpse to be even for a brief moment permitted to show itself in the light of the sun Much more is it pleased when it has for nearly a score of years been by retirement from practice, separated from its confreres and the progress of medicine so that it can no longer understand articles in the medical journals and is reduced to reading the editorial columns

Again I am personally under great obligation to the house of Cheever, father and son, for I was an interne under the elder affectionately known to us as "bloody Davey" I cheer-

fully shed my own blood when the knife used by the younger member of the family enabled me to join again the procession in peace and comfort and therefore, whatever he asks me to do I shall try to do

He seems to think that it may be interesting to this assemblage of young men—and I include Dr Worcester in that category—to hear something of the Hospital and what was done there in the days when I was acquiring a practical medical education His second suggestion that I might talk of the present professional horizon, is quite out of the question I have no gift of foresight, but I may say that if the science of medicine in the next fifty years makes advances at all comparable with those since the days of my internship the horizon is far beyond our vision Do not predict too much Never tell a patient he or she is going to die, or be too sure about recovery I have never quite forgiven the leading Boston physician who in 1884 told me that if I wanted to live I must go to Colorado and remain there for the rest of my life Incidentally, I never went Oliver Wendell Holmes in 1846 stated that 'medicine may make further advances, but surgery has probably reached the apex of its possible achievement', and Daniel Webster a few years earlier in the course of a debate about the Oregon question said that it was futile to get excited about the matter because the place was so far away that nobody would ever go there

\*Delivered April 27 1936

†Woodward Samuel B — President of the Medical Society 1916-19 For report and address of author see This Week's Issue Page 48

sores and wounds, in the application of fomentations, poultices and minor dressings, in the administration of enemas and in various other obvious things, they were instructed in the application of leeches and subsequent treatment, which latter provision marks rather accurately the period of which I am speaking

I hold here a card printed by the hospital in 1878. On it is a list of the trustees, staff and house officers. Whether or not there is anything in the Boston City Hospital atmosphere condu-

cive to longevity, I do not know, but, it is a fact that of the thirty men whose names I now read to you, but two died before they were fifty and but eight before they were seventy while of the remaining twenty-two ten reached the age of eighty one being at the time of his death eighty-one, one eighty-two, three eighty-four, two eighty eight and one, Dr Ingalls, ninety. All my fellow internes have passed on and of all those figuring on this little sheet I alone remain

## MEDICAL PROGRESS

### THE PROGRESS OF NUTRITION

BY FRANCIS LOWELL BURNETT M.D.\*

ILL HEALTH, INDIGESTION, AND MALNUTRITION,  
AND VOMITING BY THE COLON  
FROM WRONG EATING

“THE wonder is not that structural imperfections and functional disharmonies should develop in proportion to our numbers but rather that so many of us escape harm altogether and enjoy good health. The solution of our problem of life is a fuller knowledge of the use and working of those parts of our bodies most apt to give way under our modern ways of living—the use of such structures as the great bowel. And when we have replaced our ignorance by real knowledge we shall be in a position not to adapt our bodily structures to our mode of living, but our mode of living to our bodily structures. The large bowel is not a useless or superfluous organ but one which we in our ignorance are maltreating” (Keith, A., *Lancet*, 2 1047, 1925)

In the first place, when we reflect on our varied and often obviously wrong ways of eating, it is a “wonder that so many of us escape harm altogether and enjoy good health” But health is such a vague and variable condition of the human body, and so little is yet known about it, that many of us believe we are healthy if we are not distressed or incapacitated by disease. Even patients with chronic diseases may not be discomforted or incapacitated, and if through treatment they become relieved, they may be only temporarily restored to health, as these diseases almost invariably recur. There is such a wide range in this state of freedom from incapacitation or discomfort, that it resembles one brought about by Cramer (*Lancet* 1 633 1924) in experimental animals, and described in “The Vitamines and the Borderline Between Health and Disease” In this study, rats were given a complete food, but one group

was given a vitamin rich diet, while the other was fed one low in the vitamins, and the animals were observed over a long period. As a result, those on the poor diet were free from obvious signs of disease and were able to reproduce, but in comparison with those on the good diet, were small, weak, and undeveloped. Human beings in the first stages of ill-health somewhat resemble this condition as described by Mackenzie (*The Future of Medicine*, Oxford Medical Publications, London, 1919, p 199), “The first appearance of disease is invariably insidious, with little disturbance of the economy, and no visible sign of its presence. By and by the patient becomes conscious that all is not well with him, there is a loss of that feeling of well being which accompanies the healthy state. Disagreeable sensations arise, at first vague, but later becoming more definite, and these may become so urgent that he seeks advice. Still no evidence of disease may be perceived on the most careful examination”

In the second place, normal nutrition is determined by the nutrient substances we take in, utilize, and absorb, and assimilation is the final and most important phase of the process (Webster's New International Dictionary, Harris and Allen, Springfield, Mass., G and C Merriam Co., 1924). Such a requirement makes the building up of our bodies a complex and delicately adjusted process, but in consuming food for this purpose, unless we know and apply the normal indices of absorption to our nutrition we may have nourishment going through, instead of into us and thus become run down and malnourished. Under these circumstances, we lose “that feeling of well-being which accompanies the healthy state” But if “we adapt our ways of eating and living to our bodily structures”, and chew our food thoroughly, eat regularly of only three complete and properly proportioned meals, then the colon may no longer be maltreated but serve as a part of a perfect nu-

Burnett Francis Lowell—Assistant Dermatologist and Director of Health Class for Skin Diseases, Massachusetts General Hospital. For record and address of author see This Week's Issue page 45

Heavens! I went dark for ten days to the University Hospital to see that wound dressed, and dark dressed it was, by no house officer, but by the operator in person. It was no ordinary case, and, when healing took place, he boasted of his success. Does all this seem possible to this audience?

What happened in the operating theatre? On a hook hung a pincushion into which were stuck a number of needles, threaded with silk by some unknown person, and through a loop were drawn bunches of silk ligatures of suitable length. The first assistant stuck a few of these needles into the lapel of the old coat he kept for the operating room, drew some of the ligatures through his buttonhole, went to the sink, where there was a crock full of natural sponges soaking in water, selected those having the least number of blood clots still in their meshes from former operations, squeezed them dry, threw them into a tin basin and was ready for work. The Lister steam spray (introduced while I was an intern) was turned on, operator, patient and assistants were covered with 5 per cent carbolic acid spray and the game was on. Such was the surgery in no mean hospital in 1878, such was the surgery in every hospital, such, without the spray, was the surgery in Paris and in Vienna, as I saw it in 1879 to 1881, and nobody wondered at it.

What did we do under those conditions? What cases came under operation at all? We were a busy lot. I had 110 surgical beds under my care as house surgeon with one assistant and I really did not have much time to loaf on the job. When I compare the report of the Boston City Hospital for 1878 and a report of the Worcester City Hospital with about the same number of beds even fifteen years ago, they do not seem to speak the same language. Three hundred and fifty operations in twelve months was the record, but only a small fraction of these would be considered major at the present day. The arm was amputated twice, the thigh eight times, the leg seven times, the foot three times, and the breast eight times with two fatalities. The brachial artery was tied once, the femoral artery twice all for aneurysm—two patients recovering and one dying of pyemia. The elbow was twice successfully excised, the hip twice, the superior maxilla four times and the inferior twice removed for malignant disease, with one death in each case. A needle was successfully extracted from the knee joint. By temporary depression of the superior maxilla a nasopharyngeal polypus was dislodged. Tracheotomy was done four times and laryngotracheotomy once. Cancer of the tonsil was removed through the neck. Seventeen external tumors, mostly fatty and usually of great size, were removed. Eleven strictures were divided and four perineal sections done. Two gentlemen lost a testicle and one external urethrotomy was performed. There were three lithotomies for stone. An ovarian

cyst was tapped, another removed with fatal results and a cyst of the broad ligament, so called, relieved by paracentesis. Strangulated hernia was six times operated on. Two patients died, two were pronounced well and two were said to be relieved. Dr. Gay did four so-called Heaton operations for radical cure of hernia. Hydrocele was eleven times treated without disaster, iodine being injected into the sac. Other operations for necrosis, hemorrhoids, and fistula. I will not go into such was the record of a metropolitan hospital fifty-seven years ago—a hospital, to be sure, but fourteen years established, receiving few private patients (there were but four private rooms on the surgical side) and without the prestige of the Massachusetts General Hospital, long established in the same city. With a special ward for diseases of women, not a perineum was repaired. Heaven knows there were many that needed it! The first perineal operation I ever saw I did myself some years later. There were no abdominal operations whatever. Colpoproctorrhaphy, salpingo-oophorectomy, cholecystotomy and even appendectomy would have been to us at that time words without meaning, needing as much explanation as Einstein's doctrine of relativity needs to the medical man of this day.

On January 1, 1878, Miss Linda Richards appeared as Superintendent of Nurses and Matron of the Hospital. All members of the nursing staff were forced to join the training school or resign. Shortly afterwards three graduates of Bellevue Hospital Training School appeared on the scene as head nurses in certain wards. Hated by those whom they were displacing, contemptuous of internes and ostracized as much as possible by all, they surely had a hard time at first. They introduced screens and accompanied the medical men even into the male wards, where no female had previously been admitted. They were not looked upon with favor by the staff. Dr. Fiske on one occasion asked for a towel as he was about to examine a male patient. The nurse brought a screen. "I asked for a towel," said he. The nurse brought another screen. "Damn your screens," shouted the enraged physician. He knocked both of them flat, pulled up the bedclothes and proceeded to examine the naked man much to the indignation of his female assistant. But things quieted down and before many months everybody noticed the improvement in conditions. The house officers were relieved of many routine duties and trained nurses acquired the popularity they deserved. I notice in the announcement of the establishment of the training school that the most desirable age for candidates was from twenty-five to thirty-five and that they were required to be sober, honest, truthful, trustworthy, punctual, quiet, orderly, cleanly, neat, patient, kind and cheerful—a rather large order! Besides instruction in the dressing of blisters, burns,

but in those of Rhondda, pneumonia otitis media, lymphadenitis, and hypertrophied tonsils were found to be the most prevalent disorders. From a study of the diets of 1339 Italian children Winternitz (*Igiene Mod*, 28 175 1935), 17 per cent were found to be inadequate in amount and most of them were inadequate in composition. About 29 per cent had practically no meat and the remainder about one-sixth of what they should have had, about 36.6 per cent had no eggs and the others had one every other day, and the milk consumption was reduced, inasmuch as only 125 to 200 cc were used by a child a day. Little fruit too was eaten. In the children on poor diets the incidence of tuberculosis was increased.

The value of an egg a day as a supplement to a low-priced diet for children has been observed by Rose and Borgeson (*Child Dev Monographs*, No 17 Bur Publications Columbia University N Y City, 1935). In this study two very nearly identical groups of children were selected, and given much the same food, with the exception that those of one group were given an egg a day. After almost two years all of the children were examined and those having the supplementary feeding showed little difference in weight or height, but they were less anemic and had fewer and milder colds than those without the extra food. Afterward liver was substituted for an egg as a supplementary food but this did not reduce the anemia any more. On the other hand, Tisdall (*Canad M A J*, 33 624 1935) has found that when vitamin B concentrate was added to a good diet of children in an institution, the rate of growth increased 1.6 times that of children without the supplementary food in seven months. When vitamin D was added to the food dental caries in the children was reduced one half, as compared with a control group. The supplement of 26 mg of iron and 12 mg of copper added to the diet, brought about an increase of 20 per cent hemoglobin in less than a year. Davis (*Am J Dis Child* 49 611, 1935) has tried the effects of acid and base forming diets on the calcium phosphorus and nitrogen retention of children. The only significant fact revealed was that more N was retained with the basic diet as the Ca and P balances were quite the same with both kinds of food.

Observations on the value of ingesting large amounts of vitamin A and C concentrates by 450 laborers and 200 soldiers, have been made by Gudjonsson (*Hospitaltid*, 78 657, 1935). The laborers treated lost fewer days at work and declared they felt better than a control group and the soldiers that were abnormally lean became heavier and those that were overweight became leaner than others without the vitamins. From a comprehensive and detailed survey of the food consumed by and the health

of the inhabitants of central Java Donath and DeLangen (*Landbouw*, 10 Nos 4 & 5, pp 424 1935) have found that the protein requirement was met, but that only 2 to 10 per cent was of animal origin as about 60 per cent was derived from rice and 20 to 30 per cent from soya beans. Milk was available for infants only, and a fat consumption of 30 gr per head per day was low and probably made a deficiency of vitamins A and D. Physical examinations of the peasants and the members of their families showed them to be underweight and with reduced blood pressures, and they were thought to be in a predeficient condition, but definite signs of avitaminosis were not found. Changes in the selection of meats by the English people between 1924 and 1927, have been noted by Menzies-Kitchen (*Farm Economist*, 1 141, 1935). During this period the consumption of beef and veal fell 10 per cent, while that of bacon, mutton and lamb increased 12, 20, and 46 per cent, respectively. In an analysis of the food selected by college girls of today Wheeler and Mallar (*J Am Dietet A*, 10 453 1935) have compiled the following figures. The food contained 2,397 calories and cost forty-one to forty-six cents a day and the protein amounted to 70 gr. Ca 0.92 gr. P 1.32 gr. and Fe 0.0118 gr., and the vitamin content was 6616 units of A and 227 of C. Through an inquiry of patients with gastrointestinal disorders from foods found indigestible Alvarez and Hinshaw (*J A M A* 104 2053 1935) have listed the following articles: raw onions, cream, milk, raw apples, cabbage, tomatoes, cucumbers, radishes and chocolate.

The successful treatment of chronic constipation without the use of laxatives has been carried out by Tharsen (*Hospitaltid* 78 1269 1935) over a period of fifteen years. By the use of this method in many patients more than 90 per cent have been cured. In those without HCl the administration of this acid in the dilute form often brought about the desired result. In others the consumption of many vegetables and fruits and drinking beer at meals was generally beneficial. In the beginning of treatment a little liquid paraffin was allowed and massage of the abdominal wall and exercises were found to be useful adjuncts in the correction of constipation. By the use of a low fat diet and frequent supervision, Neale et al (*Am J Dis Child*, 50 1502, 1935) have successfully treated eighteen and have had good immediate results in ninety-three patients with celiac disease. The diet was combined with the persistent use of vitamin D or ultraviolet radiation when necessary for rickets, tetany or osteoporosis. Gutzeit (*München med Wchnschr* 82 1021 1935) has described disturbances of intestinal motility and has stated that the intestine, like the heart was operated primarily



tritive apparatus, and thus relieve indigestion and malnutrition.

In the third place diarrhea is a recognized functional disorder and is sometimes caused by the ingestion of incomplete food (Burnett and Howe, *J. A. M. A.*, 88:1705, 1927), yet in a comprehensive study of this disorder in more than 100 patients, recently, by Brown (*Am. J. Surg.*, 15:483, 1932), the cause of it in two-thirds of the patients could not be accurately determined. Perhaps if a more critical attitude had been taken in regard to the normal operation of the nutritive apparatus from right eating, the cause of the disorder in many more of these patients might have been determined. For there is wisdom in the inward parts, and the proximal colon as an operating part of a perfect nutritive apparatus as well as the heart, has understanding, and diarrhea as well as soft and formless dejections are signs of an abnormal colonic function. In the former, such a violent and propulsive action is obviously a marked indication of the rejection of a mixture unsuited for absorption by the body and assimilation by the cells, in normal nutrition, and in the latter while the action is less violent, it is nevertheless an indication of a rejected mixture, and of vomiting by the colon. Under these circumstances, vomiting by the colon is generally relieved by an improvement in the quantity and quality of the food consumed, for when this is done, the colon becomes receptive, a secondary digestive pouch is formed of the proximal portion, and as a sign of this action the intestinal contents are entirely moulded into uniform segments to form the normal feces and to measure the normal intestinal rate. Thus these normal indices of absorption can be made to serve as a new and exact basis for normal nutrition, and the creation and control of an improved and precise state of health (Burnett *New Eng. J. Med.*, 205:251, 1931).

#### FOOD, HEALTH AND THE NUTRITIVE APPARATUS

From a study of the old Icelandic literature, Gudjonsson (*Deutsche med. Wchnschr.*, 61:1507, 1935) has found that the ancient Nordic people were very healthy. Epidemics did not occur,ickets was rare, and beriberi and skin diseases were seldom mentioned. Scurvy was not alluded to until 1200 A.D., but it was often described during the sixteenth century. The unusual health of these people was thought due to the consumption of an abundance of meat and protein derived from the internal organs, cheese, butter, milk and ground cereals, many vegetables and fruits, and a plentiful supply of leaves, mosses and lichens. The points of view of several physicians prominent in the field of nutrition have been presented recently in illuminating articles—that of Hopkins (*Brit.*

*U. J.*, 1:571, 1935) on the "Study of Human Nutrition: The Outlook Today" emphasized the value of a reduction in the protein content of the food from 100 to 80 gr. a day, and that of McLester (*J. A. M. A.*, 104:2144, 1935) on "Nutrition and the Future of Man" suggested that improved nutrition in man would produce "a larger stature, greater vigor, increased longevity and a higher cultural attainment", since "now—to a measurable degree—man was now master of his own destiny".

The Commission on Nutrition of the League of Nations (Geneva, 1935) has issued a report on the physiological bases of nutrition. In this report some of the deficiencies found in the food consumed by man today have been pointed out, and these referred more to the reduced ingestion of foods containing sufficient vitamins and minerals, than to the caloric value of the food. For the Commission considered that 2,400 calories per day were sufficient for an adult of sedentary habits, but to this fifty calories should be added for each hour of light muscular work, 100 for moderate work, and 100 to 200 for hard work. They recommended also that 35 gr. of protein per kilogram of body weight be ingested by children from one to three years of age, 3 gr. for those from three to five and 25 gr. for those from five to fifteen years. The human requirements for the vitamins have been compiled by the Committee on Nutrition of the American Public Health Association (*Am. Pub. Health Year Book*, 69, 1934 & 1935). They consider that 750 cc. of breast milk which contained 2,000 international units of vitamin A a day, should be sufficient for the average infant, but 3 cc. of cod liver oil of average potency was necessary for older children and for adults. Of vitamin B, 50 to 200 international units a day were needed by children from infancy to adolescence, and of vitamin C, an amount equal to 30 gr. of dried yeast should be used, daily. Of vitamin D, an infant required 100 international units and an adult 300 (30 cc. of lemon juice), a day.

In a comparison of the nutritive condition of elementary school children of Maryland during the years from 1921 to 1927 and 1933 to 1934, Palmer (*Pub. Health Rep.*, 49:1453, 1934) has found little difference. The average weight of the boys was found exactly the same, but that of the girls was slightly reduced in a few, in 1934. An English report on the health of school children living in Cardiff as compared with those of Rhondda, and compiled by Watkins (*Brit. U. J.* 1:1256, 1935), showed that 83.2 per cent were reported as good and 16.8 per cent as fair in the former town, whereas, 91.7 per cent of the children were considered to be in good and only 8.3 per cent in fair, health in Rhondda. The ill health in the children of Cardiff was due to whooping cough and measles,

considered responsible for infections in infancy, but an adequate diet in early life and one containing sufficient vitamin A was thought to prevent the incidence of infectious. On the other hand Gittleman and Wiener (*J Pediatr* 7 81 1935) made a study of 275 children in an asylum. The children were divided into three groups and given viosterol halibut liver oil and corn oil, respectively, but there was found to be no difference in the number or in the severity of the infections in any one group. Observations on the effects of vitamin A on the incidence and severity of colds in 200 college students over a period of two years have been made by Cameron (*J Am Dietet A*, 11 189 1935). In carrying out this study, the students were divided into two groups, and those of one group were either given foods rich in vitamin A or cod liver oil while those of the other group were given no medication or a lactose preparation. The results obtained were that colds were as frequent in the members of one group as in those of the other, but that the severity of the infections was somewhat reduced in those that had an abundance of vitamin A.

#### BERIBERI, PELLAGRA, AND NERVE DISORDERS

The course, diagnosis and treatment of infantile beriberi in Japan have been described by Maeda (*Monatsschr f Kinderh*, 61 289 1935), and the following measures recommended. All mothers should receive a diet rich in vitamin B. In patients with the mild form of the disease breast feeding may be continued, in those with the moderate form breast feeding should be supplemented with cow's milk, and in those with the severe form, breast feeding should be given up entirely, and replaced by cow's milk, and vitamin B concentrates administered.

In a study of ten patients with pellagra admitted to a hospital in Philadelphia, Garrett (*Am J M Sc* 190 525 1935) found the four D's of diarrhea, dermatitis, delirium, and death, typical. Of this number two developed the disease in the South, three had had a greatly restricted diet for a long period, four were addicted to alcoholic beverages and had consumed very little food, and one developed the disease as the result of a gastrointestinal lesion and the ingestion of little food. The food consumed by twenty-three patients who developed pellagra in Northern Moravia and Silesia has been reported by Materna (*Med Klin*, 31 708, 1935). In these provinces the Czechs eat a great deal of cereal food and few vegetables or fruits. Such a diet was thought to cause catarrhal enteritis which results in the schizophrenia and melancholia of pellagra. The gastric contents of twenty-five pellagrins have been analyzed by Flinker (*Arch f Verdauungskr* 57 282, 1935) and found to be low or without HCl, and this

was considered a contributing cause of pellagra. The effect of sunlight on patients with pellagra has been studied and reported on by Spies (*Arch Int Med*, 56 920 1935). The patients were admitted to a hospital, and were given a restricted diet and one low in vitamin G especially, then one half the group was exposed daily to increasing doses from a quartz lamp, while the other group received increasing exposures in the sunlight. In both kinds of treatment the skin became tanned but without an increase in the dermatitis. The result showed that the sunlight had a beneficial effect on the disease, for four potential pellagrins who volunteered to consume the pellagra producing diet were kept out of the sunlight and developed incipient lesions of pellagra. Through the diet recommended by Spies (*J A M A*, 104 1377 1935) for the treatment of pellagra the death rate of patients admitted to a hospital has been reduced from 54 to 6 per cent. The food consumed consisted of about 4000 calories, and was supplemented by the addition of 75-100 gr of dry yeast powder, 200 gr of desiccated hog's stomach, 200-300 gr of wheat germ oil or 75-100 of liver extract by mouth or parenterally in severe cases. Careful nursing too and symptomatic treatment were carried out.

A disease resembling pellagra and one that afflicted 50 per cent of the prisoners in the Johore and Singapore jails has been described by Landon and Pallister (*Ti Roy Soc Trop Med d Hyg*, 29 121 1935). The disease was characterized by eczematous lesions of the scrotum and the corners of the mouth and glossitis. Later nerve lesions developed, which affected the gait and eyesight of the patients. The addition of marmite or yeast to the diet brought about a marked improvement in a few weeks, as the food given the prisoners was found generally adequate, but low in vitamin G. Two patients with secondary pellagra have been reported by Holst (*Hospitaltid*, 78 713 1935), one was a woman of forty-four years who had a thyroid deficiency, achlorhydria, and gastritis and was able to eat very little food, the other was a patient who had pneumonia and encephalitis, and developed typical lesions of the skin during the course of these diseases. Another patient described by Brester and Hulst (*Nederl tijdschr v geneesk*, 79 158, 1935), was also a woman, but of forty-six years, who had had intermittent attacks of diarrhea for eight years. The disease was diagnosed, intestinal tuberculosis, in spite of the fact that skin and nerve lesions, an anemia and melancholia developed, which are generally signs of secondary pellagra. The authors suggested that the disease was due primarily to a failure in the absorption of food. Lesions of deficient states in seventy-five patients with ulcerative colitis have been recorded.



through the intramural nervous system, and according to its contents and its nutrition, but its action changed also from other influences. In the treatment of constipation a gastrointestinal series and the examination of the feces of the patient was frequently found useful, but the continued use of laxatives or the ingestion of a diet containing a great deal of fibrous food, was likely to exacerbate the constipation and produce colitis. The changes that occur in the gastrointestinal tract of patients with deficient diseases, have been recorded by Mackie and Pound (*J A M A*, 104 613, 1935). Through roentgenograms when there is edema of the mucous membrane, disorganization of the normal motor activity, or a reduction in the tone of the intestinal muscle, the development of deficient diseases was suspected. Observations made on patients with gastrointestinal disorders from incomplete food by Schmidt (*Acta med Scandinav*, 84 456, 1935), showed that in avitaminosis A there was an atrophy of the intestines, in a deficiency of B complex an achlorhydria, and without C there was a predisposition to gastric ulceration.

#### OPHTHALMIA, DISEASES OF THE EYES, AND INFECTIONS

A complete and scientific evaluation of vitamin A in nutrition has been compiled by Richards (*Brit M J*, 1 99, 1935). An unusual opportunity to study vitamin A deficiency in the natives of Uganda has been made use of and reported by Loewenthal (*Ann Trop Med*, 29 349 & 407, 1935). In this remote district the dry season limits the food supply to millet, maize, cassava, and ground nuts. Meat, eggs, and milk were not to be had, and few vegetables were available at this time. As a result of the examination of 1112 adults and children, 277 were found to have phrynodermia and 44 ophthalmia. The consumption of sun-dried sweet potatoes might have prevented the development of the disease in many. In evaluating the symptoms of the disease from a study of 500 patients, the author stated that the disease may be very general, and not only include xerophthalmia and phrynodermia, but also may be manifested in neuritis, sore mouth, diarrhea, dysentery, infections, and changes in the hair. In a study of the development of vitamin A deficiency, Sweet and K'ang (*Am J Dis Child*, 50 699, 1935) have observed that night blindness was an early and prominent symptom in about half of the 200 patients examined. Keratomalacia and diarrhea were common symptoms, and a fever and a cough sometimes occurred, but lesions of the skin were infrequently found. In the pathological material examined, metaplasia was of general occurrence but the lesions varied, for it was often found in the larynx, trachea, and esophagus, but rarely in the renal

pelvis or uterine mucosa. Through a fistula of the thoracic duct in the pleural cavity of a patient Drummond et al (*Brit M J*, 1 1208, 1935) had an unusual opportunity to study the absorption of carotene and vitamin A. They found that almost all of vitamin A but very little of ingested carotene, were recovered in the chyle, but when present they were in a colloidal form and were closely associated with dispersed fat. The requirement of bile in the alimentary canal for the normal reduction of vitamin A, has been demonstrated by Altschule (*Arch Path*, 20 845, 1935) in postmortem examinations of eleven infants with atresia of the bile ducts. All of these infants had received a diet adequate in vitamin A, yet in six of them lesions typical of vitamin A deficiency were found.

In a discussion of the relation between vitamin deficiency and the development of ocular lesions in animals and man, Yudkin (*Arch Ophth*, 14 112, 1935) has described the recently recorded observations on night blindness, as well as the effects of the deprivation of vitamin B on the eyes. Cataracts may be experimentally produced in rats from food devoid of vitamin G, but as yet a definite relationship has not yet been established between fibrosis of the lens and pellagra in man. In an inquiry of the ways of eating of several hundred patients with disorders of the eyes and ears, Moose (*Arch Otolaryng* 21 64, 1935) has found that half of the number consume food deficient in protein and calcium, 10 per cent partake of food deficient in vitamin D and two per cent eat food poor in vitamin C. A follicular keratosis of the skin which was sometimes associated with xerophthalmia and keratomalacia in patients with vitamin A deficiency, has been observed and reported on by Frazier and Hu (*Trans 9th Congress Far Eastern Assoc Trop Med*, 1 461, 1934). In this disorder the abeyance of secretions from the glands of the skin was a prominent symptom, and this and the dermatosis might be the only signs of the vitamin A deficiency. Observations of the carotene and vitamin A content of the sera of fifty healthy persons have been carried out and recorded by Wendt (*Klin Wochenschr*, 14 9, 1935). The results obtained were somewhat varied, but made an average of 86 "yellow" units and 14 "blue" units, respectively. These values were found to be very low in patients with a disorder of fat resorption, as well as in those with exophthalmic goiter. They were found to be high in patients with diabetes mellitus, and after liver therapy in those with pernicious anemia.

The relation between the vitamins and especially vitamin A and infections has been pointed out by Clausen (*J A M A* 104 793, 1935). Many factors besides the food consumed were

ure to administer vitamin C for forty-eight hours resulted in negative tests in adults but such a deprivation brought about an increase in the strength of the test in infants. Such a result suggested that infants were able to synthesize vitamin C. On good diets, healthy males were found to excrete about 25 mg of ascorbic acid in the urine, by Euler and Malmberg (*Skenska hem Tidn*, 47 25, 1935), pregnant women from 15-30 mg while a nine months' old infant may not excrete any ascorbic acid.

In a study of the gastric contents of patients with diseases of the skin and analyzed fractionally Brown et al (*Brit J Dermat* 47 1-1 1935) have found them low in HCl. This was found to be especially true of acne rosacea and in the treatment of these patients the administration of large doses of dilute HCl combined with a strict diet, brought about an improvement in these disorders. On the supposition that some of the chronic diseases of the skin were due to malnutrition from wrong eating Becker (*Arch f Verdauungshr* 56 260 1934) has given patients with eczema bread and other cereal foods made of soy bean flour and has found them much benefited. The results signified that as this flour, in contrast with that made from grains, was not acid the alimentary mixture was made alkaline and normal. According to the observations of Tate (*Arch Dis Childhood* 10 27, 1935) papular urticaria is a definite disease, which is not produced by injections of histamine. The disease occurred most frequently in early life, and especially in the spring and fall months. Dentition and digestive disorders were thought to be predisposing causes of the disease. The indigestion was considered due to the ingestion of too much cereal food, for when this food was reduced in the diet of these patients the disease was frequently relieved. The relief of psoriasis in a child from improved nutrition alone has been reported by Schiff (*Jahrb f Kinderh* 145 299, 1935). The patient was admitted to a hospital, and allowed only vegetables and fruit for a period of three months. At the end of this time, the red and scaly areas had entirely disappeared, and the patient was sent home. Calves' liver and more vegetables were then added to the diet, and after five weeks the skin continued healthy.

#### RICKETS OSTEOMALACIA DENTAL DECAY, AND ARTHRITIS

In Egypt infants are almost entirely breast-fed and there is an average of ten hours of sunlight daily. Yet in Cairo, Sabri (*J Egyptian M A* 18 138 1935) found that 50 per cent of the infants had rickets. Here the beneficial effects of the sunlight are very much reduced during the winter months on account of the clouded

air from the sandstorms and the low content of pro vitamin D found in the mothers milk, was another factor that permitted the development of rickets. The mothers of breast-fed infants who show signs of rickets should be irradiated or consume irradiated milk according to the recommendations of Wieland (*Monatsschr f Kinderh* 61 144, 1934). Then besides the infants should receive a vitamin D concentrate in some form daily. From physical examinations of 900 children living in an inland valley of Norway made by Rustung (*Acta Paediat*, 17 1 [supp 2] 1935) rickets was found prevalent. Most of the children had been breast-fed up to the fourth month when supplementary feedings of cow's milk were begun. All of the mothers ate a little butter although the consumption of oleomargarine in the district had increased recently. They ate little meat or fish, and drank little milk, and breadstuffs, potatoes and turnips formed a large part of their rations. Cod liver was used as a diagnostic or curative agent. The disease was most prevalent in infants that were taken off the breast early, in those that spent little time in the open air and in those of the farmers' wives who lived in the remote districts and were less likely to be informed about the measures to adopt to prevent rickets.

Two types of osteomalacia have been recognized by Liu et al (*Chinese M J* 49 1 1935). In one the Ca of the serum was found low but the P normal there was little decalcification of the bones, and tetany and lenticular opacities occurred. In the other the Ca was normal but the P decreased there were tenderness and deformities of the bones and the decalcification of the bones was marked. Both types responded to vitamin D therapy. Severe osteomalacia in two Chinese women has been reported by Maxwell (*Proc Roy Soc Med* 28 265 1935). Both of the women were pregnant and delivery required Caesarian section. The operations however proved fatal and in postmortem examinations gross deformities of the pelvic bones were found in the women. In both infants very evident signs of rickets were found also. The food consumed by the women was found to be low in quantity and poor in quality as little meat eggs milk or animal fat had been eaten. The quality of the protein was poor and the foods containing minerals and vitamin D were seldom ingested. The infants not only showed rickets but also a hypoplasia of the enamel on the teeth. The occurrence of osteomalacia in a few English women has been recorded by Bulmer (*Lancet* 228 740 1935). The women showed signs of osteoporosis deformities of the pelvic bones and a lowered Ca/P ratio but in both of them the ovaries were normal. The administration of vitamin D brought about symptomatic relief. The use of viosterol and

by Mackie (*J A M A* 104 175, 1935). In all but twenty-eight of this number a sign or signs of one or another of these states were found. Most of the patients were anemic, glossitis and atrophy of the tongue occurred in a large number, and atrophy of the skin, hyperkeratosis and dermatitis were found in some. A few of the patients had edema and a low plasma protein.

The consumption of a well balanced and high vitamin diet by patients with "alcoholic" polyneuritis, even when a quart of whiskey has been taken daily, has been found by Strauss (*Am J M Sc*, 189 378, 1935) to relieve the disorder. The parenteral injections of vitamin B concentrates as well as liver extracts were found beneficial also. The anemia developing in patients with "alcoholic" pellagra has been studied by Spies and Chinn (*J Clin Investigation*, 14 941, 1935) and the following results reported. In thirty consecutive patients admitted to a hospital, the hemoglobin was found to be 74 per cent and the corpuscles had an average of 3,500,000 cells. In analyses of the gastric contents of these patients, low values were obtained for free HCl, pepsinogen, and for rennin. The addition of a crystalline vitamin B preparation to the diets of 100 patients with neuritis has been shown to be generally beneficial by Vorhaus et al (*J A M A*, 105 1580, 1935), for of this number forty-four were rendered free of symptoms, forty-eight were improved, and eight were not benefited.

#### SCURVY AND DISEASES OF THE SKIN

The early lesions of scurvy in children from radiograms of the bones have been revealed and described by Park et al (*Arch Dis Childhood*, 10 265, 1935), for the diagnosis of the disease had not been made in these patients until the outlines of the bones were seen. Of the 125 patients more than half of the number were infants and had been fed on pasteurized milk. In a study of the blood of scorbutic infants anemia was not always evident, but that found was either ortho- or normo-chromic and accompanied by a slight microcytosis in some of the patients. Bleeding and clotting times and platelet counts were found normal. Orange juice added to the food of the patients produced a reticulocytosis and a complete regeneration of the blood. In the treatment of two anemic adults with scurvy reported by Dunlop and Scarborough (*Edinburgh M J*, 42 476, 1935), the condition of the blood did not improve after the addition of vitamin C alone to a good diet, but when still further reinforced with 60 mg of ascorbic acid daily, the symptoms of the disease and the anemia were relieved in a few weeks. Favorable results in the treatment of scorbutic patients from the administration of ascorbic acid have been re-

ported also by Wright (*Proc Soc Exptl Biol & Med*, 32 475, 1934), by Abt and Epstein (*J A M A* 104 634, 1935), and by Bell (*Lancet* 228 547 1935).

The Gothlein capillary resistance test has been applied to 418 boys in an institution by Mohr (*J Lab & Clin Med*, 21 43 1935), and although the food given the boys was considered adequate, 43 per cent were found positive. Orange and tomato juice were added to the diets of the prescorbutic boys and when they were tested again only three were still positive. In testing the very young by this means Lundquist (*Acta Paediat*, 17 247 [supp 1], 1935) observed that the capillary resistance was high in infancy but became reduced up to two and one half years. A study of the capillary resistance of forty patients with achylia by Schultzer and Grus (*Acta med Scandinav*, 85 563, 1935) showed that sixteen were normal and twenty-four had a lowered resistance. Some of the latter improved by the use of lemon juice and one by injections of ascorbic acid, but in seven the capillary resistance remained low in spite of all kinds of antiscorbutic treatment. By the use of this test as well as from radiograms of the teeth, Ohnell (*Acta med Scandinav*, p 67 [supp 59] June, 1934) found signs of scurvy in twenty-six out of sixty-two patients treated for persistent diarrhea due to duodenal ulcers or chronic colitis.

A thorough test of the value of dichlorophenolindophenol titration for ascorbic acid in the urine to determine hypovitaminosis C has been carried out by Guldager and Poulsen (*Hospitalstid*, 78 1029 1935). In five healthy adults the amount of the acid was found to vary from 31 to 39 mg, while in a healthy infant only 12 mg was obtained. In ten convalescent patients the amount excreted ranged from 12 to 38 mg with the exception of a three year old boy who had only 8 mg and a twelve year old girl who had 113 mg. Then in twelve patients who were suspected of having scurvy the values for the ascorbic acid in the urine varied from 12 to 87 mg. From an examination of the food consumed by the healthy persons and the patients, the amount of vitamin C ingested did not have any relation to the amount of ascorbic acid found in the urine. This point was still further borne out after the administration of 250 to 1,000 mg of ascorbic acid to some of these patients, for this procedure seldom caused an increase in the amount of the acid excreted, but after daily doses of 300 mg were given a saturation point was reached in three to twelve days when very high values in the excretion of the acid were obtained. A test of monomethyl diphosphotungstic acid to determine hypovitaminosis C by means of the urine has been made by Rohmer and Bezssonoff (*Arch Dis Childhood*, 10 319 1935). With this reagent a fail-

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In Egypt infants are almost entirely breast-fed and there is an average of ten hours of sunlight daily, yet in Cairo, Sabri (*J Egyptian M A* 18 138, 1935) found that 50 per cent of the infants had rickets. Here the beneficial effects of the sunlight are very much reduced during the winter months on account of the clouded

air from the sandstorms, and the low content of pro-vitamin D found in the mothers' milk, was another factor that permitted the development of rickets. The mothers of breast-fed infants who show signs of rickets should be irradiated or consume irradiated milk according to the recommendations of Wieland (*Monatsschr f Kinderh* 61 144, 1934). Then besides the infants should receive a vitamin D concentrate in some form daily. From physical examinations of 900 children living in an inland valley of Norway made by Rustung (*Acta Paediat*, 17.1 [supp 2] 1935) rickets was found prevalent. Most of the children had been breast-fed up to the fourth month when supplementary feedings of cow's milk were begun. All of the mothers ate a little butter, although the consumption of oleomargarine in the district had increased recently. They ate little meat or fish, and drank little milk, and breadstuffs, potatoes, and turnips formed a large part of their rations. Cod liver was used as a diagnostic or curative agent. The disease was most prevalent in infants that were taken off the breast early, in those that spent little time in the open air, and in those of the farmers' wives who lived in the remote districts and were less likely to be informed about the measures to adopt to prevent rickets.

Two types of osteomalacia have been recognized by Liu et al (*Chinese M J* 49 1 1935). In one the Ca of the serum was found low but the P normal, there was little decalcification of the bones, and tetany and leucular opacities occurred. In the other the Ca was normal but the P decreased, there were tenderness and deformities of the bones, and the decalcification of the bones was marked. Both types responded to vitamin D therapy. Severe osteomalacia in two Chinese women has been reported by Maxwell (*Proc Roy Soc Med* 28 265 1935). Both of the women were pregnant and delivery required Caesarian section. The operations however proved fatal and in postmortem examinations gross deformities of the pelvic bones were found in the women. In both infants very evident signs of rickets were found also. The food consumed by the women was found to be low in quantity and poor in quality as little meat, eggs, milk or animal fat had been eaten. The quality of the protein was poor and the foods containing minerals and vitamin D were seldom ingested. The infants not only showed rickets but also a hypoplasia of the enamel on the teeth. The occurrence of osteomalacia in a few English women has been recorded by Bulmer (*Lancet*, 228 740 1935). The women showed signs of osteoporosis, deformities of the pelvic bones, and a lowered Ca/P ratio, but in both of them the ovaries were normal. The administration of vitamin D brought about symptomatic relief. The use of roosterol and

injections of parathyroid extracts in two patients with osteogenesis imperfecta has been tried by Hansen (*Am J Dis Child*, 50 132, 1935), and found to be valueless. In fact the injections of the parathyroid preparation appeared to aggravate the disorder. The pathology of extreme osteoporosis in an elderly woman has been described by Lebowich (*Arch Path*, 20 742, 1935). The patient died a few months after a spontaneous fracture. In the examination, changes were found at the juncture of bone and cartilage, osteoid tissue had overgrown the decalcified areas, and fibrous tissue had invaded the bone marrow.

From an examination of the teeth found in the skulls of prehistoric (Holocene period) South Africans by Dreyer (*Nature*, 136 302, 1935) cavities were not found. On this account dental caries was considered a disease of modern times. After a study of the relation between food consumption and dental caries in the natives of the Swiss Alps, Outer Hebrides, Alaska, and Northern Canada, Price (*Dental Cosmos*, 77 841, 1935) has made a similar investigation of the South Sea Islanders. This investigation was carried out primarily to determine the effect of a basic diet, which these islanders invariably consume. In the primitive Polynesians only 0.34 per cent of caries was found, but in those in contact with civilization 30.8 per cent of cavities were found. Such a variation is somewhat similar to those found in the other natives who consumed an acid diet, it was therefore concluded that the acid base balance was not related to dental caries. In another similar study by the same investigator (*Dental Cosmos*, 77 1033, 1935), deformities of the dental arches were observed in relation to food consumption of the native and "civilized" Polynesians. Somewhat the same results were obtained, for in the native consuming sea food, vegetables and fruit, not a single deformity was found, whereas in the more civilized who consumed a great deal of cereal food, marked irregularities of the arches were often apparent. Observations on dental caries and food consumption in the Bantus of South Africa have been made by Oranje et al (*South African J M Sc*, 1 57, 1935). Few cavities were found in the primitive people who subsisted on mealies and kaffir corn mostly, and a high percentage of caries was revealed in the members of this tribe who were a little better off financially, and were able to buy and eat European delicacies and especially sweets. The influence of vitamin D therapy on dental caries has been studied by Soei (*Acta Paediat*, 15 307, 1934) in 536 children, and was found generally valueless as caries could not be prevented. Treatment of the mother during the prenatal period was considered the most useful measure.

The food consumption of seventy-five patients

with arthritis has been analyzed by Hall and Myers (*Arch Int Med*, 55 403, 1935), and in the hypertrophic group 50 per cent of the patients consumed too much, but in the atrophic group 20 per cent did not eat sufficient food. On the other hand Bauer (*J A M A*, 104 1, 1935) has pointed out that in gout, patients should be advised to partake of a purine diet, but in arthritis with obesity, they should consume a restricted diet but one adequate in its vitamin and protein content. In a study of the diets of families, from which children with arthritis came, by Warner and Winterton (*Quart J Med*, 4 227, 1935), the food consumption per person daily was found to be 3260 calories or 100 calories above that consumed per person in a control group of families. Then in the "rheumatic" families 96.5 gr of animal protein was eaten daily as compared with 86 gr in the control families, but in the latter more milk, though less fruit and fewer vegetables were consumed. The relation between food consumption and the swelling of the joints in arthritic patients has been studied by Scull and Pemberton (*Ann Int Med*, 8 1247, 1935), and a reduction of the swelling and clinical improvement occurred if a low calorie but a high protein and fat diet were consumed. The investigators further point out that vigorous sweating, purgation, and diuresis in these patients were not only useless but might be dangerous.

#### DIABETES MELLITUS, OBESITY, AND FAT METABOLISM

An unweighed and slightly restricted diet for the use of diabetic children has been recommended by Herlitz (*Acta Paediat*, 18 1 [supp 2], 1935). In the use of this diet, breads, sugars, and potatoes alone were reduced, and the disease was controlled by the administration of insulin as required. By the adoption of these measures, all of the children treated developed normally and several of them took part in strenuous athletic games without detriment. As a result, ketonuria was seldom found, and the fasting blood sugar varied between 0.2 and 0.35 per cent. A diet made up largely of vegetables and fruit and low in protein has been used and advised by Fanconi (*Jahrb f Kinderh*, 144 311, 1935), for diabetic children. Such a diet was found to be strongly basic and thus prevented acidosis. Patients in coma were stimulated with injections of caffeine, cognac, or coramine, and also given large amounts of mineral water, by mouth, subcutaneously, or intravenously. Insulin was given until the urine became free of sugar. The effects of insulin in the treatment of nondiabetic but severely malnourished children, have been studied by Tow (*New York State J Med*, 35 719, 1935). Through the use of this measure, the children showed a vigorous appetite, consumed 2,500 to 3,000 calories a day, and gained from one to

three pounds a week. In an attempt to feed a control group 2,500 calories daily and without insulin, the meals were not relished, insufficient food was ingested and the weight of the children was not increased.

The food consumed by diabetics before the onset of the disease has been recorded by Himsworth and Marshall (*Clin Sc* 2 95 1935). The records showed that these potential patients had eaten an equal amount of protein, but less carbohydrate and more fat than that consumed by normal persons, and that such a disproportion of food was thought to reduce the tolerance for sugar. In a somewhat similar survey made by Himsworth (*Clin Sc* 2 117 1935), of the food consumed by prediabetics of different races and countries, high fat and low carbohydrate meals were the rule. To stabilize the diabetic on a food with a reasonable amount of carbohydrate Eicklentz (*Deutsche med Wchnschr* 61 1911, 1935) has evolved the following form of treatment. When the diagnosis was made in these patients—with the exception of those in coma—a liter of milk was allowed a day only for two consecutive days. After this the food was increased somewhat to 1-2 gr. of carbohydrate 1-1½ gr. of protein to each kg. of body weight, but less than 70 gr. of fat, was allowed a day. As the clinical condition improved on this diet the use of insulin was withheld unless the glycosuria persisted, and then enough was given to reduce it. And when the patient had become stabilized on this regime, the protein and fat content of the diet were not changed, but a free choice of carbohydrate food was allowed and this at times amounted to as much as 300 gr. daily. The value of the high fat and low carbohydrate and the low fat and high carbohydrate diets in the treatment of diabetes mellitus has been studied and reported by Watson and Wharton (*Quart J Med* 4 277 1935). In this work specimens of urine and blood were examined frequently and the patients' opinion of the diets sought. The low fat and high carbohydrate diet produced the most glucose and thus required the most insulin, but was the most liked by the patients. A high carbohydrate diet, with 100 gr. of fat and 60 to 70 gr. of protein a day, was the one advocated. Schellong (*Klin Wchnschr*, 14 487 1935) has had bread and other food made of soya bean flour for the use of diabetics and has found them not only satisfying but beneficial. One hundred grams of this bread contains only 122 calories, and there is less starch in it compared with bread made of wheat flour. In a few patients with diabetes Mauriac and Saric (*Schweiz med Wchnschr*, 65 382, 1935) have found that by alternating a green vegetable diet with the standard diet every few days less insulin is required to keep the blood sugar normal.

In the treatment of 100 obese patients, Baver and Gray (*Am J Med Sc*, 189 86, 1935) found that in seventy-two the weight became stationary if the patients kept on the diet for a period of four months. Still more weight was lost by forty-one patients if the dietetic was combined with thyroid treatment, and by thirteen patients when the basal metabolism was normal and dinitrophenol could be used. Post-operative deaths have been analyzed by Seifert (*Munchen med Wchnschr*, 81 1917, 1934), who found that in the obese after appendectomy, cholecystectomy or gastric section for ulcer or cancer, a fatal outcome was much more common than in thin patients, and was generally due to cardiac failure. And in an analysis of postoperative complications these were more frequent in the obese than in the lean, also. After the ingestion of 500 cc. of 20 per cent cream in a fat tolerance test, Blotner (*Arch Int Med* 55 121 1935) found the plasma cholesterol little changed in the normal person, slightly decreased in the lean but much increased in fat persons.

#### THE ANEMIAS, SPRUE, AND KIDNEY STONES

The relation between hypochromic anemia in children and achlorhydric anemia in adults has been pointed out by Faber et al. (*J Pediat* 7 435 1935). In the young patients who responded to two grams of ferric ammonium sulphate a day histamine was given, and gastric analyses revealed achlor- and hypochlorhydria. The results suggested that if these conditions were not relieved in youth they were likely to progress to a hypochromic and microcytic anemia in later life. In the treatment of patients made anemic from hemorrhages due to ulcerations of the gastrointestinal tract Richel (*Hospitalsid*, 78 889, 1935) has advocated the principles of Meulengracht, by which a liberal purgative diet was administered. Of the 220 patients treated by these principles the mortality was only one per cent as compared with eight per cent in other kinds of treatment. Furthermore by the use of these principles constipation was seldom a factor and the regeneration of blood was rapid. In an article entitled "Gastrectomy and Gastroenterostomy Anemia," Hartfall (*Guy's Hosp Rep*, 84 448, 1934) has collected forty cases of severe anemia following one or the other of these operations. In the patients there were gastrointestinal symptoms of abdominal pain, sometimes vomiting, and almost always diarrhea; then there was also a failure in the absorption of the food for radiological tests showed a rapid emptying time of the stomach as well as rapid propulsion of the aliment through the intestines.

A commendable and comprehensive point of view has been presented by Minot (*J A M A* 105 1176, 1935), on the prevention etiology,



prognosis, and treatment of the anemias due to malnutrition. The author has pointed out that the loss of blood was only one manifestation of the deficient condition of the patient, and in the microcytic type large doses of iron alone were insufficient, but that the diet too must be made adequate. In the prevention of the macrocytic type, slight and early disorders of the body, such as chronic indigestion, persistent diarrhea, insufficient, true or poorly fitting false teeth, sore tongue, and incipient nerve disorders with macrocytosis of the corpuscles, must be effectively treated. In another article, Minot (*The Am Physicians*, 49:287, 1934) has pointed out the use of the reticulocyte response for the determination of the value of the different forms of liver therapy and similar kinds of treatment in patients with pernicious anemia. The onset, course, and duration of this response varied according to the amount and kind of material used, the amount of gastrointestinal absorption, and the previous condition of the patient. In an attempt to determine the potency of forty-five liver extracts, used orally and parenterally in the treatment of pernicious anemia, Deutsch and Wilkinson (*Brit J Exper Path*, 16:33, 1935) have found that the hemopoietic clinical test and the Duesberg and Koll methemoglobin test, were not in any way related. Meulengracht (*Acta med Scandinav*, 85:50, 1935) has tried extracts made of different portions of pig's stomach on patients with pernicious anemia. Dried, defatted, and pulverized portions of the cardiac glands were found to be less potent than those of the pyloric glands or of the duodenum. The suggestion was made that the "factor" was contained in the pyloric, Brunner's, and similar glands, but not in those secreting pepsin, rennin, or hydrochloric acid. Pig's colon as well as the stomach evidently contained the active principle, for Schemensky (*Deutsche med Wchnschr*, 61:961, 1935) found that twenty patients with pernicious anemia showed a blood regeneration, which however was a little slow, when preparations from the large gut were used in treatment. Three chemical fractions of liver have been prepared by Fiske et al (*J Clin Investigation*, 14:709, 1935), and tested for the regeneration of blood in patients. The fractions used individually were impotent, but collectively were of great value.

In the Nobel Prize Lecture on nutrition and blood regeneration, Whipple (*J A M A*, 104:791, 1935) has pointed out that some of the amino acids like phenylalanine, tyrosine, and proline have a definite influence on the production of corpuscles in anemic dogs. The hemoglobin reserve as influenced by different kinds of food has been determined by Rosenthal, Robbins, and Whipple (*Am J Physiol*, 112:27, 1935). This was done by feeding growing

dogs from the time of weaning to one year of age, on the salmon and bread diet, and on this diet supplemented with meat or with liver, and the hemoglobin estimated. The basic diet produced only 30 gr., the supplement of meat brought about an increase to 91 gr., and the liver increased the reserve store of hemoglobin to 115 gr. In another study by these investigators (*Am J Physiol*, 113:467, 1935) observations were made on blood regeneration in standardized anemic dogs, from feeding them the "secondary anemia fraction", "the pernicious anemia fraction", and "the residue". The fractions were made of the liver, kidney, and spleen of the pig. The results obtained were that the fractions had greater potency than the fresh tissue, and in that of beef heart "the residue" alone was greater than the fresh tissue.

In a study of the dietary habits of patients with sprue in Porto Rico, Castle et al (*Arch Int Med*, 56:627, 1935) have found that little meat, few eggs, and little milk were consumed, but rice, shell beans, bread, and tropical vegetables and fruits. And in examinations of the blood of these patients, a macrocytic anemia, which was quite similar to the pernicious type, was found. The relief of mild cases of sprue was often brought about by the addition of meat to the food of the patients, but those of moderate severity required the "extrinsic factor" incubated with HCl, and those still worse needed liver extract, orally and parenterally. The etiology of sprue has been discussed by Weise (*Arch f Schiffs u Tropen Hyg*, 39:425, 1935), and from the lesions of the intestines as well as from the curative value of milk or liver, the conclusion was reached that the disease was one of deficiency origin—like pellagra, and was one in which there was a failure of absorption rather than a deficiency in the food consumed. From a study of thirty-eight women with sprue, van Steenis (*Nederl tijdschr v gynecesk*, 79:2062, 1935) found that eight were pregnant, and of this number four had had a recurrence when with child, and that delivery brought about an improvement in the condition, or complete recovery.

The value of rest and liver therapy for patients with subacute combined degeneration of the cord, has been studied by Farquharson (*Canad M A J*, 33:473, 1935), and beneficial results obtained. In this treatment, patients were required to rest in bed for three months, and two or three times the amount of fresh liver or extract generally used, was given. Even so, recovery was found to be slow and eight months sometimes elapsed before signs of improvement became manifest. Through the experimental production of calcium in animals fed on a vitamin A deficient diet Higgins (*New Eng J Med*, 213:1007, 1935) has made up

and tried a clinical form of treatment. This consisted largely of an acid ash diet, to which foods rich in vitamin A were added, and by the use of it in twenty-three patients with stones too large to pass through the ureter partial dissolution took place. The diet has been found especially useful as a postoperative measure, since the recurrence of stone formation in patients has been reduced from 164 to 47 per cent.

#### LACTATION, GOITER AND TUBERCULOSIS

The value of a good diet consumed by, as compared with one freely chosen by, expectant mothers on lactation has been observed by Tarr and McNeile (*Am J Obst & Gynec* 29 811 1935). The former diet was especially plentiful in vitamin B, from eggs, milk, vegetables, fruit, and cereals while the latter was very varied and contained less than 50 per cent of the protective foods. As a result, the women who consumed the former food were more easily managed and produced more and better milk, as they were quite free from the indigestion that frequently troubled the other group. A somewhat similar study, but one that related more to the amount of food consumed by pregnant women on the quantity and quality of their milk, has been made by Hoegh (*Hospitaltid*, 78 No 26, 1935). In these observations, the women were divided into three groups. Group one was given the full diet of 3 000 calories, 70 gr of protein, and 5 to 6 gr of salt, the second on the fever diet had 2,500 calories 44 gr of protein, and 26 of salt, and the third consumed the protective diet of 1 540 calories, 22 gr of protein, and 2 gr of salt a day. The value of these diets on lactation was determined by graphs of the infant's weight from birth to ten days of age. Surprising as it may seem, the restricted and low calorie diet of the protective foods ingested by the mothers, produced the best results.

An elaborate article on the prevention and pathogenesis of goiter has been written by Marine (*J A M A*, 104 2334, 1935). And one on the problem of goiter in childhood, has been made up by Wieland (*Arch f Kinderh*, 105 129, 1935). The Goiter Commission of the Netherlands has carried out a survey of the food consumed by the Dutch in relation to its iodine content, and the results have been recorded by Meerburg (*Nederl tijdschr v geneesk*, 79 3289, 1935). The report showed that the food was generally deficient in this essential element, as it seldom contained the necessary amount of 80 to 100 mg of iodine per person a day and several plans for the prevention of the disease were recommended. One was to add the required amount of an iodine salt to the milk or drinking water and the other and more in

genious plan was to give iodized rations to all of the animals that produced or that were used for food, for example cows, hens, and sheep. Danelopolu et al (*Bull Offic internat d hyg pub* 27 706 1935) have made an investigation of endemic goiter in Roumania, and have found the disease generally due to the drinking of water from surface wells and rivers, and the consumption of a lactovegetarian food, by the people. Kodama et al (*J Orient Med* 22 47 1935) have found similar conditions in Mongolia, for here some of the well water examined contained only 41/ to 137/ of iodine per liter. Furthermore the people of this country seldom ate meat, fish, and foods made of seaweed, but beans, millet, onions and garlic, or foods that contained little iodine were the staple articles of their diet.

The relation between the iodine content of cabbage and potatoes and the incidence of goiter found in the drafted men from sections of Minnesota, has been reported by McClendon and Holdridge (*Biochem J*, 29 272, 1935). In the northeastern section of this state the cabbage was found to contain 111 and the potatoes 101 of iodine per kg, and 172 of 1000 men had an enlarged thyroid gland, but in the southwestern section the cabbage contained 174 and the potatoes 227, and only 85 of 1000 men were goitrous. From the general use of iodized salt in Michigan to prevent goiter, McClure (*Science*, 82 370, 1935) has reported that the disease has been reduced to negligible proportions. Up to the second year of its use, there had been a slight increase of patients with thyroid adenomata, which sometimes required surgical intervention. Of 934 children with goiter and under ten years of age, which have been reported by Bram (*N Times & Long Island M J*, 63 241, 1935) 832 have the disease in the sporadic, and 102 in the exophthalmic form, 720 of the patients were girls and only ninety-two were boys. In the treatment of patients with the sporadic type, foci of infection if found should be removed, and unhygienic habits or erroneous ways of eating should be corrected, but iodine given cautiously and according to the metabolic rate was found to be the most valuable therapeutic measure.

The effects of viosterol on tuberculous children have been observed by Poncher and Gasul (*Am Rev Tuberc*, 30 358, 1934). In this treatment 150 drops were given to a patient a day for four months, but at the end of this period an improvement was not apparent, accordingly the amount was increased to 300 drops a day and continued for three months, and at the end of this period the condition of the children had not only not improved but more than half of them had lost in weight. The loss of weight was made up and augmented by means of a good diet and without medication. Stein-



bach and Rosenblatt (*Am Rev Tuberc*, 31 35, 1935) have carried out a study on the effects of vitamin therapy on patients with advanced intestinal tuberculosis, but found these measures valueless. A report on the resistance to tuberculosis in the people of Norway, has been made by Overland (*Tijdschr f d noisike Laegefor*, 55 730, 1935). In a comparison of the military recruits found positive by the tuberculin test, there were as many in 1934 as in 1911, yet the mortality from the disease had diminished a great deal in this time. In a comparison of the incidence of the disease in one of the districts in this country, there had been a reduction of 50 per cent in twelve years. Then the mortality from the disease in a fishing district was found to be 0.28 per cent, whereas in a farming district it was only 0.12 per cent. On account of these facts, the suggestion was made that the resistance to tuberculosis was due to better nutrition rather than to better housing. The fisherfolk almost invariably ate oleomargarine, canned

milk, sweet stuff, and coffee, but the farmer folk lived on the surplus supplies of their land that they were unable to dispose of in dairies and markets.

Tuberculosis of the joints and bones in patients has been treated by a special diet by Stempa (*Am Rev Tuberc*, 30 365, 1934), and found beneficial. The diet consisted largely of raw vegetables and fruits, and contained only 2 gr of salt per patient a day. Furthermore the fluid intake was limited to two cups of fruit or vegetable juices, a cup of coffee and one of tea, and two glasses of milk. Neumann (*Wien klin Wchnschr*, 48 273, 1935) has confirmed other results in the value of the Gerson diet for lupus and surgical tuberculosis, but was unable to treat pulmonary tuberculosis successfully by this method. On the other hand, von Weisl (*Fortschr d Med*, 53 185, 1935) has observed that the patients on the strict Gerson diet can not tolerate some foods they had previously enjoyed, and often became allergic.

#### FACTS ABOUT CHILDREN AND FAMILIES

Readjustments in the medical field and in hospital organization in keeping with the United States population trend are foreseen by John Glossinger, Vice President of the Knj Scheerer Corporation.

He stated in a recent report that children are becoming fewer in the United States population. Whereas in 1920 children under five years of age comprised 10.9 per cent of the total population, by 1930 this age group formed only 9.3 per cent of the whole. This is all the more striking, he said, in that during the same decade the total population increased 16.1 per cent.

Mr Glossinger also cited these additional interesting Census Bureau figures about the sizes of American families. In 1930 there were in the United States 23,352,990 intact marriages, that is, marriages untouched by death or divorce. The largest category—almost a third of all—was the group of 7,447,328 families who are childless. One-child families numbered 5,254,863; families with two children 4,246,459; those with three children, 2,650,730; and those with four or more children 3,753,610. There were fewer children in city families than in rural families.

#### MORTALITY RATES

Telegraphic returns from 86 cities with a total population of thirty-seven millions for the week

ending June 20 indicate a mortality rate of 10.8 as against a rate of 10.9 for the corresponding week of last year. The highest rate (20.6) appears for El Paso, Texas, and the lowest (5.9) for South Bend, Ind. The highest infant mortality rate (19.3) appears for El Paso, Texas, and the lowest for Kansas City, Kans., Lynn, Mass., Miami, Fla., Paterson, N. J., Somerville, Mass., South Bend, Ind., Tacoma, Wash., Wilmington, Del., Yonkers, N. Y., and Youngstown, Ohio, which reported no infant mortality.

The annual rate for 86 cities is 13.0 for the twenty-five weeks of 1936, as against a rate of 12.3 for the corresponding period of the previous year.

#### SUMMARY OF DEATHS AND DEATH RATES (ANNUAL BASIS) FROM AUTOMOBILE ACCIDENTS PER 100,000 ESTIMATED POPULATION FOR 86 CITIES FOR CORRESPONDING PERIODS OF 1936 AND 1935

	Week ending		First 25 weeks	
	June 20 1936	June 22 1935	1936	1935
Total deaths	144	143	3,571	3,970
Death rate	20.1	19.9	20.0	22.1
Deaths due to accidents in city	105	109	2,769	3,201
Death rate	14.7	15.2	15.5	17.8

—Bulletin Bureau of the Census

CASE RECORDS  
of the  
MASSACHUSETTS GENERAL  
HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED  
IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

FOUNDED BY RICHARD C CABOT, M.D

TRACY B MALLORY, M.D., *Editor*

CASE 22271

PRESENTATION OF CASE

*First Admission* A sixty-eight year old Scotch minister was first admitted complaining of abdominal pain

For many years the patient had had epigastric discomfort occurring about one and a half hours after meals and usually relieved by the ingestion of soda. Three years before entry an x-ray examination showed a gastric ulcer. Diet and medication were prescribed and subsequently his symptoms subsided until four months prior to admission. At this time, while under mental strain his symptoms recurred and were not relieved by reinstitution of his previous regime. On the day before coming to the hospital he was suddenly seized with severe pain in the upper abdomen. This was associated with profuse perspiration, nausea and emesis and was only relieved after several hypodermic injections.

Physical examination was not noted at this entry.

The temperature was 98°, the pulse 130. The respirations were 20.

Shortly after entry a laparotomy was performed and a perforated duodenal ulcer was sutured. The patient responded well postoperatively and two weeks later a posterior gastroenterostomy was performed. He was discharged improved on the thirtieth hospital day.

*Final Admission*, two years and eight months later.

About two months before reentry the patient had an attack of bronchopneumonia complicated by bilateral otitis media. He recovered from this acute illness but remained quite weak and easily fatigable. He returned to his church duties however, and was apparently well until four days before readmission, when he first noticed numbness in both thumbs which spread to involve the lateral aspects of both forearms. This was accompanied by pain in both shoulders radiating down the arms and was associated with increasing weakness of the muscles of the forearms and hands. There was also

some numbness in the lateral aspect of the left thigh with slight related pain but no muscular weakness. On the day of entry there was some pain in the left ankle and numbness of the second and third toes.

Physical examination showed a well-developed and nourished elderly man complaining of pain in the upper extremities. The lungs were clear. The heart was slightly enlarged to the left. The sounds were of poor quality and there was a systolic murmur heard best at the apex. The second sound had lessened intensity and a short diastolic murmur was audible. Its location was not given. The blood pressure was 157/70. The abdomen was slightly distended but not tender. The liver edge extended slightly beyond the costal margin. The sensorium was clear. The cranial nerves were negative except for slight impairment of hearing. There was definite weakness of the muscles of the upper extremities, chiefly of the lower arms and intrinsic muscles of the hands. He was unable to appose either thumb but their adduction was unimpaired. There was no atrophy or fibrillation. Constricting pressure over the upper arms caused pain to be referred down the radial aspects of both hands. There was no tenderness elicited over the lower extremities. Vibration and position sense were normal but there was hypesthesia to pinprick down the anterolateral aspects of both forearms and hands and the lateral aspect of the left leg. The biceps reflexes were feeble and the triceps, radials, abdominals, and ankle jerks were absent. The knee jerks were normal. No abnormal reflexes were elicited.

The temperature was 98.6°, the pulse 105. The respirations were 20.

Examination of the urine showed a specific gravity of 1.020 and a large amount of albumin. The sediment contained 15 white blood cells, 20 red blood cells and a rare finely granular cast. The blood showed a red cell count of 4,700,000, with a hemoglobin of 80 per cent. The white cell count was 14,000, 61 per cent polymorphonuclears, 9 lymphocytes, 3 monocytes, and 27 eosinophils. The stools were negative for blood, ova and parasites. A Hinton test was negative. The blood sugar was 100 milligrams. A lumbar puncture showed an initial pressure of 150 with normal dynamics. The cell count was 1 monocyte and 2 red blood cells. Ammonium sulphate and Wassermann tests were negative. The total protein was 21 milligrams.

X-ray examination of the chest showed a normal diaphragm. The apices and periphery of the lungs were clear. There was moderate thickening of the lung markings, particularly on the right side. The aorta showed extensive calcification but the heart was not enlarged. There

bach and Rosenblatt (*Am Rev Tuberc*, 31 35, 1935) have carried out a study on the effects of vitamin therapy on patients with advanced intestinal tuberculosis, but found these measures valueless. A report on the resistance to tuberculosis in the people of Norway, has been made by Overland (*Tidsskrift for den norske Lægeforening*, 55 730, 1935). In a comparison of the military recruits found positive by the tuberculin test, there were as many in 1934 as in 1911, yet the mortality from the disease had diminished a great deal in this time. In a comparison of the incidence of the disease in one of the districts in this country, there had been a reduction of 50 per cent in twelve years. Then the mortality from the disease in a fishing district was found to be 0.28 per cent, whereas in a farming district it was only 0.12 per cent. On account of these facts, the suggestion was made that the resistance to tuberculosis was due to better nutrition rather than to better housing. The fisher-folk almost invariably ate oleomargarine, canned

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#### FACTS ABOUT CHILDREN AND FAMILIES

Readjustments in the medical field and in hospital organization in keeping with the United States population trend are foreseen by John Glossinger, Vice President of the Kny Scheerer Corporation.

He stated in a recent report that children are becoming fewer in the United States population. Whereas in 1920 children under five years of age comprised 10.9 per cent of the total population, by 1930 this age group formed only 9.3 per cent of the whole. This is all the more striking, he said, in that during the same decade the total population increased 16.1 per cent.

Mr. Glossinger also cited these additional interesting Census Bureau figures about the sizes of American families. In 1930 there were in the United States 23,352,990 intact marriages, that is, marriages untouched by death or divorce. The largest category—almost a third of all—was the group of 7,447,328 families who are childless. One-child families numbered 5,254,863; families with two children 4,246,459; those with three children, 2,650,730; and those with four or more children 3,753,610. There were fewer children in city families than in rural families.

#### MORTALITY RATES

Telegraphic returns from 86 cities with a total population of thirty-seven millions for the week

ending June 20 indicate a mortality rate of 10.8 as against a rate of 10.9 for the corresponding week of last year. The highest rate (20.6) appears for El Paso, Texas, and the lowest (5.9) for South Bend, Ind. The highest infant mortality rate (19.3) appears for El Paso, Texas, and the lowest for Kansas City, Kans. Lynn, Mass., Miami, Fla., Paterson, N. J., Somerville, Mass., South Bend, Ind., Tacoma, Wash., Wilmington, Del., Yonkers, N. Y., and Youngstown, Ohio, which reported no infant mortality.

The annual rate for 86 cities is 13.0 for the twenty-five weeks of 1936 as against a rate of 12.3 for the corresponding period of the previous year.

#### SUMMARY OF DEATHS AND DEATH RATES (ANNUAL BASIS) FROM AUTOMOBILE ACCIDENTS PER 100,000 ESTIMATED POPULATION FOR 86 CITIES FOR CORRESPONDING PERIODS OF 1936 AND 1935

	Week ending		First 25 weeks	
	June 20 1936	June 22 1935	1936	1935
Total deaths	144	143	3,571	3,970
Death rate	20.1	19.9	20.0	22.1
Deaths due to accidents in city	105	109	2,769	3,201
Death rate	14.7	15.2	15.5	17.8

—Bulletin, Bureau of the Census

out that he had some chemosis of the conjunctivae. Before he died the clinical diagnosis was changed to periarteritis nodosa.

#### CLINICAL DIAGNOSIS

Periarteritis nodosa

DR WYMAN RICHARDSON'S DIAGNOSIS

Periarteritis nodosa

#### ANATOMIC DIAGNOSES

Periarteritis nodosa

Pulmonary abscesses

Bronchopneumonia

Pleuritis, acute fibrinopurulent left

Gangrenous pharyngitis

Septicemia streptococcus hemolyticus

Arteriosclerosis generalized, marked aortic and coronary

Coronary occlusion, organized, left descending

Perisplenitis acute and chronic

Duodenal ulcer, healed

Operative scar gastrojejunostomy

#### PATHOLOGIC DISCUSSION

DR TRACY B. MALLORY: A biopsy was done from the deltoid muscle shortly before death and showed the characteristic lesion of periarteritis nodosa. At autopsy the gross changes were not particularly striking except for the lungs. There is nothing in the history to give any clue to that but he had multiple septic abscesses in his lungs which I think were the immediate cause of death. I do not believe that they were caused by the periarteritis nodosa. I assume that they represent superimposed sepsis in a moribund patient. The kidneys were a little large, the capsules stripped very easily and left smooth surfaces covered with petechial hemorrhages. Grossly they looked like acute glomerulonephritis. There were multiple small infarcts in the spleen. The myocardium showed comparatively little in gross. There was a complete old calcified closure of the descending branch of the left coronary artery, without any infarction beyond it, and a very severe grade of calcified sclerosis throughout the aorta.

Microscopically we have been able to pick up characteristic arterial lesions in a great variety of tissues. They were most numerous in the muscles. Every section of muscle showed numerous areas. They were also present in the heart and there were, as Dr. Richardson predicted, numerous small foci of myocardial degeneration of various ages, some still acute and some beginning to show scarring. The arterial lesions were particularly well marked in the capsule of the adrenal. The kidneys showed comparatively little in the larger arteries but very marked changes in the glomeruli. These

glomerular changes look more like what Volhard and Fahr originally described and illustrated as their "mischform", supposed at the time to be a combination of vascular and glomerulonephritis, than any other kidneys I have seen. Later this type of kidney was reinterpreted as malignant vascular nephritis and if we had these kidneys alone without the rest of the case that is the diagnosis I would have to make.

I will show you one or two of these slides. This is the adrenal and there in the fat tissue at the edge of the cortex you can see numerous small arteries, averaging probably a quarter of a millimeter in diameter which show very marked periarterial thickening. This consists in part of fibrosis, to a considerable extent of infiltration of leukocytes, and occasional eosinophils. In the right hand vessel you can see close to the lumen an area which stains rather intensely. That is an area of acute necrosis of the media of the artery. That is perhaps the most characteristic finding of all and often leads to a mural aneurysm formation on one side of a vessel wall. It is quite characteristic that all stages of the process are found at the time of autopsy, old scarred lesions and fresh very active progressive ones. On the whole the majority of the lesions in this case appear to be fairly old.

This is the kidney cortex. At this power you can see multiple long lines of leukocytic infiltration following down the tubules. At this higher power I think you can definitely see the abnormality of the glomeruli. They contain a great many masses of intensely staining hyaline fibrin. There is much thickening of the capillary basement membrane, some proliferation of the endothelium and not infrequent crescent formation. On the right here is a small artery showing two masses of fibrin in its wall, definite necrosis of the media and the characteristic lesion of periarteritis. Nearly every glomerulus in the kidney is involved. A great many of the tubules contain masses of red cells. I think it is surprising that he did not show gross hematuria.

#### CASE 22272

##### PRESENTATION OF CASE

*First Admission.* A fifty-three year old white native cook was admitted complaining of pain and swelling at the base of the penis.

The patient had gonorrheal stricture of the urethra of many years' duration for which he received treatment in the Out Patient Department. A periurethral abscess was drained and he was discharged on the fourth hospital day.

*Second Admission,* one year later.

Following his discharge he received further

were no cervical ribs or other osseous abnormalities noted

There was no relief of symptoms and on the eighth day the patient's throat was sore and slightly injected. There subsequently appeared irregular pharyngeal ulcerations but subjectively he felt better. There was no febrile reaction but the pulse remained elevated to 100 or over. The white cell count of the blood rose to 35,000, 35 per cent eosinophils. The patient became progressively weaker, the soreness of the throat recurred with increased severity and on the sixteenth hospital day the temperature rose to 104°. Two days later he lapsed into coma and died on the nineteenth day after entry.

#### DIFFERENTIAL DIAGNOSIS

DR WILMAN RICHARDSON The first admission we will leave as being of no significance in regard to his death. He apparently had a perforated duodenal ulcer which was relieved by operation. On the basis of the history of his second admission the thing that I thought of first was the possibility of some neoplasm involving the cervical spine. I also tried to figure out whether he had anything involving the aorta which shut off the blood supply to his arms. We later find that that is not so. Also I tried to figure out whether this could be a central nervous system type of pernicious anemia, but it is extraordinary to have the thumbs alone involved and unusual to have so much pain and no evidence of interference with deep muscle sense.

The physical examination is essentially negative except for some question about the heart and except for evidence of involvement of the nerves of both arms. Also, the leg is apparently involved in this same process.

Then we go on to the laboratory tests and there we find a urine which is rather curious. It shows a pretty fair gravity for a man of seventy-one but contains a large amount of albumin, red cells and casts. There are no renal function tests reported, presumably they were normal if done. The striking thing of course is the presence of an eosinophilia. Let us see what can cause twenty-seven per cent eosinophilia. One of these is the so-called idiopathic eosinophilia, the cause of which we do not know. It is possibly hereditary in some cases. Another cause is leukemia. There may be eosinophilia in leukemia but there is nothing else to suggest it here. The allergic eosinophilia rarely goes this high, there is no allergy in this case. Trichinosis is the most common cause of eosinophilia of this degree. Can he have trichinosis? We can make out a fairly good picture of it. He has pains in his muscles and he has an eosinophilia, and patients with trichinosis sometimes do die. However, when they do die the picture

is, except for the increased white count and eosinophilia, a typhoid-like picture with high fever. There is one other condition which is known to cause eosinophilia in about twenty per cent of the cases and that is periarteritis nodosa. Periarteritis nodosa is a rare disease and I think is often overlooked. The symptoms of the disease are included in a tetrad of symptoms reported by Myer and by Brinkman. The first of these symptoms is what is called a "chlorotic marasmus." I take this to mean a gradual loss of weight and strength and gradual weakness together with a hypochromic anemia. This patient has loss of strength and increasing weakness, although he has no anemia. The second important symptom of this disease is polyneuritis and polymyositis. This patient has these. The third important symptom is gradually progressing renal failure which, in many of the reported cases I have read of, starts with albuminuria and hematuria and otherwise apparently pretty normal kidneys, a picture which I think is very similar to the one described here. The final important symptoms are gradually increasing and very severe gastric symptoms due to mesenteric vessel involvement and often resulting in gangrene of the gut. There is no evidence of that in this patient. However, when you apply these criteria to this patient it seems that the picture becomes very clear. The disease, as you know, is an involvement of the smaller arteries and the symptoms that result are due to the cutting off of the circulation. I think that possibly Dr. Mallory can tell us more about that. Therefore, the symptoms depend upon where the disease happens to hit. I have mentioned the most common sites except to say the muscles are frequently involved. The heart vessels are often involved so there may be cardiac symptoms and the vessels of the brain are generally involved very late in the disease. I will, therefore, make an unequivocal diagnosis of periarteritis nodosa. I will predict that the kidneys will be granular and show multiple infarcts. I will predict that the cardiac muscle will show some patchy fibrosis. I do not think the diastolic murmur was due to this disease. I think he will have aortic arteriosclerosis. The question of what killed him is still somewhat obscure. The ulcers in the pharynx were probably due to infarcts and not sepsis. There is the possibility of involvement of the bowel which was overlooked because the patient was so seriously ill.

DR FRANCIS T. HUNTER When I first saw this man he had an eosinophilia of 25 to 30 per cent. Of course the most common cause of such a high eosinophilia is trichinosis, and that is what we thought he had, because of the tender muscles. The curious part of it was that he had no fever, a point distinctly against trichinosis. I do not believe that the history brought

This normal convalescence, you will notice, did not follow, because a third admission, two and a half months later, was made necessary by a persistent fistula at the site of the appendix operation. This is shown by this note: "Following discharge the lateral drainage wound continued to discharge small amounts of seropurulent material."

The surgeon then was faced with the problem of accounting for the persistence of this sinus following drainage operation for acute appendicitis and you will notice that thirteen days were taken to investigate this case. The first information that we have is, for instance, the urine examination, the urine was loaded with pus cells. Naturally the surgeon would also ask for an x-ray examination of the lower intestinal tract, so a barium enema was given.

The problem is to find the reason for the persistent discharge from the drainage tract. The first question arises as to whether the diagnosis of appendicitis, apparently confirmed at operation, was the correct one, and to check this the surgeon would refer to the pathological report. The fact that no note was made here would lead us to the conclusion that the pathologist did find an ordinary inflammatory condition of the appendix to account for the abscess and did not find some other lesion in the appendix.

DR TRACY B. MALLORY: I can add one point. The lumen of the appendix was entirely obliterated by old fibrous tissue. There was an inflammatory process in the wall.

DR VINCENT: Naturally we would consult the pathology report to see whether we could conclude definitely that it was acute appendicitis to begin with. That throws a little doubt on it at once. The next question is whether they really removed the appendix, whether the surgeon could have mistaken a Meckel's diverticulum or diverticulum of misplaced sigmoid. I do not suppose you could mistake diverticulum of the bladder for the appendix. We are sure that mistake was not made because the pathologist says it was the appendix that was removed. The very fact that the appendix which was removed did not show a typical lesion of the inside structure of the appendix perhaps raises the question whether there could be another lesion which caused the abscess in the region of the appendix. The x-ray would seem to exclude the fact that the lesion was in the cecum, such as tuberculosis or cancer with the perforation and the formation of an abscess. So I think with the data we have been given we would be justified in excluding a lesion of the cecum.

To go back in this man's past history, he had a long story of stricture formation and obstruction of the urinary tract which, as you know, often leads to infection higher in the

tract. He also had a urine that was loaded with white cells. Now with those facts the surgeon would naturally ask the genito-urinary specialist to investigate this individual from that point of view. I have no doubt it was done but we have no report of the findings. That would be to exclude the possibility of hydro-nephrosis with perhaps perinephritic abscess or diverticulitis, with perivesicular inflammation, that would account for the collection of pus that happened to be in the region of the appendix. In the absence of any information along these lines, I think we can assume that although the patient showed pathology of the genito-urinary tract it was not the cause of the abscess. Therefore, in spite of the pathologist's report which throws some doubt on the diagnosis of appendicitis we apparently have a case of appendicitis and persistent fistula. What are the most usual causes of persistent appendiceal fistula? I think one is that all of the appendix has not been removed. That can be excluded by the report of the operation. Another is that the septic process in the appendix had resulted in a perforation into the bowel. In spite of the fact that the note states that mucoid material came from the fistula and not fecal matter, and, in spite of the fact that the x-ray shows no barium escaping from the bowel, I do not believe the possibility of a fecal fistula can be excluded. Another cause of fistula is the presence of a foreign body, such as a sponge, left there by some mistake during operation. That is always a possibility. Another is that the fistula results from a residual abscess that persists through inadequate drainage. The last possibility is, perhaps, that while the appendix was being removed a large fecolith escaped and rested in the bottom of the abscess cavity. A fistula into the bowel seems improbable by reason of the x-ray report and absence of fecal discharge. A sponge left in the appendix field I hope we can exclude. The drainage should have been adequate because the surgeon altered the usual procedure and established lateral drainage because he thought he would get more direct drainage in this way. The last possibility, the presence of fecolith, I do not think can be excluded, and for the sake of making a definite diagnosis we will say that this individual had a fecolith at the bottom of the sinus. The fact that the pathological report shows that this man did not have a definite acute lesion of the inside of the appendix throws some doubt on this diagnosis.

DR MALLORY: Are there any other suggestions?

DR ARTHUR W. ALLEN: I wonder if Dr Vincent would like to consider the possibility of some lesion of the cecum itself that may have involved the appendix secondarily, such as actinomycosis, tuberculosis, possibly cancer?

treatment for his urethral stricture which consisted of the passage of sounds and bougies. He remained comparatively well until ten days before admission, when directly after a meal he was suddenly seized with severe colicky pain beginning in the region of the umbilicus, radiating to the pubis, the epigastrium, and occasionally to the right lower quadrant. The pain recurred at intervals of about fifteen to thirty minutes and the patient was comfortable between attacks. Subsequently there was severe, sharp, constant pain in the right lower quadrant associated with tenderness in this region. There was no nausea or emesis but he had several loose bowel movements accompanied by considerable flatus which afforded him some relief. Three days before entry, his recurrent attacks having continued, usually occurring about twenty minutes after meals, there was considerable diminution in the intensity of pain. There was no fever but there were occasional chilly sensations.

Physical examination showed a well-developed and nourished man in moderate discomfort. The heart was negative. Slight dullness with diminished tactile fremitus and breath sounds were elicited in the left chest anteriorly and posteriorly. There were tenderness and spasm in the right lower quadrant and a tender, poorly defined mass was palpable just above the bium of the pelvis.

The temperature was 100°, the pulse 80. The respirations were 26.

Examination of the urine showed a specific gravity of 1.014 with a slight trace of albumin. The sediment was loaded with white blood cells. The blood showed a white cell count of 13,400.

On the second hospital day a laparotomy was performed. A mass in the region of the appendix, with the tip of the latter organ showing, was encountered. Two loops of ileum were adherent to the mass, which was entered laterally with the liberation of about half an ounce of nonodorous pus. The appendix was removed with a carbolyzed knife. There appeared to be an opening into the cecum at the base of the appendix. This and the appendiceal stump were enfolded and the omentum was brought down and tacked over the region of the abscess. A lateral stab wound was made for drainage and the anterior wound closed without drainage. On the fifteenth postoperative day the anterior abdominal wound was reopened because of evidence of infection and a large amount of foul-smelling pus was evacuated from the abdominal wall. He improved rapidly and was discharged on the twenty-first hospital day.

*Third Admission*, two and a half months later.

Following his discharge the lateral drainage wound continued to discharge small amounts of seropurulent material. For three days before

returning to the hospital there was considerable tenderness in the right lower quadrant, especially when walking. There were no other associated symptoms except the continued dysuria.

Physical examination was essentially unchanged from that previously noted. There was a sinus in the region of the stab wound from which drained mucoid material. There was some tenderness, swelling, and spasm in the right lower quadrant. Rectal examination was negative.

The temperature, pulse and respirations were normal.

Examination of the urine showed the sediment to be loaded with pus cells.

A barium enema showed entrance of the opaque medium into the terminal ileum. There was no evidence of intrinsic pathology in the colon or terminal ileum, nor did any barium leave the intestinal tract in the region of the cecum. There was a defect in the cecum suggestive of extrinsic pressure. On the following day another barium enema filled neither the terminal ileum nor the tip of the cecum. A small amount of barium trickled into the base of the cecum, which at the preceding examination had shown better filling.

The patient had some difficulty with micturition which required urethral dilatation. Subsequently he became more comfortable and on the thirteenth day a laparotomy was performed.

#### DIFFERENTIAL DIAGNOSIS

DR BETH VINCENT. It is evident that the surgeon came to the conclusion that he was dealing with a case of appendicitis possibly with some partial obstruction. There is only ten days' history of colicky pains followed by localization of definite persistent pain in the right lower quadrant with moderate temperature and white count. It is natural that he should do a laparotomy. The operative findings seem to confirm this diagnosis.

These operative findings are, as I say, consistent with acute appendicitis with about half an ounce of nonodorous pus, although we would expect a colon bacillus odor. An opening was noted in the base of the cecum which perhaps would indicate an appendicitis of a little more severity than would be indicated by the amount of pus, temperature and white count. He elected to drain the wound through a lateral stab wound, probably because of the situation of the abscess, so he closed up the laparotomy wound. During the process of the operation a portion of that wound was contaminated for he had a secondary infection in the abdominal wall. Something that might happen in a certain percentage of cases. The wound was draining at the time of discharge but the individual was sent home with the expectation of normal convalescence.



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## BOSTON AS A CENTER OF RADIATION THERAPY

RECENTLY the more striking advances in radiation therapy have centered far afield from Boston the Institut Curie, the Stockholm Radiumhemmet, the million-volt x-ray at Pasadena. Yet, thanks to interested friends, methods of cancer control second to none have been and are being developed here. The Massachusetts cancer control program rests on adequately equipped and staffed specialized hospitals.

By placing in active service its new 400,000 volt x-ray therapy apparatus, the Palmer Memorial Unit of the New England Deaconess Hospital has made available for cancer sufferers the only 400,000 volt machine in this section of the country. Moreover, through co-operation of the engineering staff in charge of the installation, for the first time a tube of so high a voltage has been immersed in oil, thus making the entire treatment room shock-proof. This permits treatment at shorter distances, greater flexibility, and therefore greater intensity than heretofore. Measurements thus far made indicate that

this new machine produces wave-lengths approaching those of radium and varying with type of filtration from 0.09 to 0.05 Angstrom. Much time must elapse before the clinical results can be evaluated but the greater depth dose obtainable should be of marked value, entirely aside from the controverted question of increased efficacy with shorter wave-length.

With this high voltage unit, with the several 200,000 volt and low voltage therapy machines now functioning, with the well-distributed radium of the Huntington and Palmer Memorial Hospitals, Boston may proudly take its place among the best equipped radiation therapy centers of the world.

Now under construction in St. Paul, Minnesota, is a 1,200,000 volt x-ray plant, the functioning of which will be watched with great interest. Whether the results gained from as costly and bulky a unit as this are worth the price remains to be seen. However, much useful knowledge will be gained and the particular range of usefulness of each type of high voltage apparatus determined.

## MORE EVIDENCE IN FAVOR OF PASTEURIZATION

THE arguments in favor of universal pasteurization of milk continue to mount until the document is formidable indeed, still the years roll on and the struggle in favor of this common-sense public health measure is contested at every point. In Massachusetts we have a long record of milk-borne epidemics of tuberculosis, scarlet fever, diphtheria and streptococcus infections, each with its lesson disregarded to a large degree, and now we are warned that the danger of infection from *Brucella abortus* is constantly increasing.

In New Jersey, last month, an epidemic of septic sore throat traced to raw milk from infected cows in a dairy near Paterson took several lives in Southwest Bergen County, and accounted for some 140 cases of illness. This epidemic is forming the basis of a campaign to ban raw milk, at last, in the city of Paterson. And so it goes, the beneficent influence of each catastrophe seems to have only a local response while elsewhere ignorance and expediency continue on their antiquated course.

We can all remember how the embattled farmers of the Berkshires fought for their constitutional right to sell infected milk, even in the wake of an epidemic which took several useful lives in and about Lee. It was not so long ago that a raw-milk-producing herd in Lincoln started a virulent epidemic of typhoid fever within twenty miles of the gilded dome of the State House.

By and large it is the rural communities that are in the greatest danger from raw milk. The



DR VINCENT I considered that but thought that we could depend upon the x-ray to give us some clue on that point

DR WYMAN RICHARDSON Is it conceivable, Dr Vincent, that there may be obstruction lower down in the large bowel with secondary perforation of the cecum as a result of that?

DR VINCENT A fecal fistula is possible but you will note that we are excluding that on the character of the discharge from the sinus and the fact that the x-ray showed the escape of no barium from the bowel

Can we not look at the x-ray? That answers Dr Richardson's question

DR VINCENT In the absence of any data as to the result of the urological examination I do not think we are justified in assuming that there was a lesion of the genito-urinary tract

DR MALLORY I wonder if anyone would care to draw conclusions from the mucoid character of the discharge?

DR ALLEN I think that is a very important point I think that is more frequently associated with malignant fistula than any other

#### CLINICAL DIAGNOSES

Carcinoma of the cecum  
Abdominal sinus

DR BETH VINCENT'S DIAGNOSIS  
Probable fecolith in abdominal sinus

PATHOLOGIC DIAGNOSIS  
Colloid adenocarcinoma of the cecum

PATHOLOGIC DISCUSSION  
DR MALLORY The slides of the appendix have been reviewed and there is no evidence of malignancy in them We did, however, note something to which very little attention was paid on the first examination The lumen of the appendix was entirely obliterated and the inflammatory process was essentially in the outer walls so that I very much doubt if it was primary appendicitis I rather think that the perforation of the cecum occurred as a primary lesion and the appendix became secondarily inflamed because of infection on the outside When he was re-explored on his last admission a very large inoperable carcinoma of the cecum was found from which a biopsy was removed which showed colloid carcinoma with marked secondary inflammation The mucus that was draining from the wound was undoubtedly produced by the tumor cells There was no evidence of perforation in the bowel, which would explain why it was impossible to force any barium into the bowel through the fistula, and I think in fected tumor was essentially the basis of the persistent fistula

ford after graduating from the Catholic University and the University of Pennsylvania School of Medicine. He has been in practice about three years.

Dr Lundborg is a graduate of Trinity College and Yale University School of Medicine. He served his internship at the Hartford Hospital and has been in practice about four years.

#### BRIDGEPORT MEDICAL ASSOCIATION

Dr William Dameshek, Assistant Professor of Medicine at Tufts College Medical School and Instructor in Medicine at Harvard University Medical School, presented a very interesting paper on Recent Advances in Hematology at the regular meeting of the Bridgeport Medical Association on Tuesday evening, June 2, at the University Club in Bridgeport. His paper aroused considerable valuable discussion among the members. The evening was a profitable one and cleared up in the minds of many members various questionable phases in this particular field of medicine.

Dr Stanley H. Osborn, State Commissioner of Health, was elected president of the Technology Club of Hartford at a meeting attended by thirty graduates of the Massachusetts Institute of Technology, June 2, at the University Club, Hartford. This is an unusual honor to be conferred upon a physician. Following the meeting, Lincoln Thompson of the Sound Specialties Company of Waterbury spoke on the development of sound recording. The latest sound reproducing and recording instruments were demonstrated.

Dr John Elmore Bailey, aged seventy-four, dean of local physicians and who practiced in Middletown for more than fifty years, died at his home in that city, June 5, 1936. Born in Middlefield, Dr Bailey attended the Middlefield District School and Durham Academy. He then entered the Eastman Business School in Poughkeepsie, N. Y., and later taught at Riverton, Connecticut. In 1880 he enrolled in the New York College of Physicians and Surgeons and in 1883 entered the New York Post-Graduate School and Hospital. Dr Bailey began practice in New York City, remaining there for one year. In September 1885 he returned to Middletown. Dr Bailey is survived by his widow, Mrs. Chrissa L. Sheidon Bailey, two sons, Paul D. of New York City and Philip A. Bailey of Middletown, one daughter, Mrs. Doris B. Ramsdell of Worcester, Mass., two sisters, Mrs. Herbert T. Barker of Providence, R. I., and Mrs. Amy Wyman of Bethlehem, Pa., and two grand children, Barbara and David Ramsdell, of Worcester, Mass.

Dr Michael A. Bailey, aged seventy-six, one of the founders of St. Francis Hospital and for many years a prominent physician in Hartford, died at his home in that city on June 6, 1936. Dr Bailey had been ill since March and although he retired from active practice ten years ago continued to receive a few former patients.

Dr Bailey was born in Scitico, town of Enfield, July 16, 1859, a son of Peter Bailey and one of a family of eight children. His father, a native of County Cork, Ireland, immigrated with his family to this country in 1848. Dr Bailey attended the local public schools and later Wiliabram Academy, Wiliabram, Mass. He learned the machinists trade at Holyoke and for ten years followed this trade in Enfield. His tastes, however, leaned strongly toward a professional career. He entered the College of Physicians and Surgeons, Baltimore, Md., from which he received his *doctoris medicinae* degree. For one year he was house physician in the Baltimore City Hospital, beginning his practice in Hartford in 1892.

Dr Bailey was a member of the Hartford Medical Society, Hartford County Medical Association, and Connecticut State Medical Society. He was an active member of the Elks. For many years he was associated in practice with his brother, Dr. George C. Bailey of Hartford, who died almost twenty years ago.

Besides his duties as a physician and the intricate details in which he was engaged with respect to the organization of St. Francis Hospital, Dr Bailey was keenly interested in municipal affairs and took an active part in their administration. He served as councilman one term on the Board of Aldermen in 1910. In 1913 he was elected for a three-year term on the Board of Education. Dr Bailey also served for some years on the board of directors and staff of St. Francis Hospital.

Besides his widow, Louise A. M. Bailey, Dr Bailey is survived by a son, Judge John M. Bailey, one brother, William Bailey of Longmeadow, Mass., and three sisters, Hannah F. Bailey and Mrs. Catherine J. Kibbe of Hartford, and Mrs. John J. Dwyer of New York City. Dr. and Mrs. Bailey recently celebrated their thirty-third wedding anniversary.

#### CONNECTICUT HOSPITAL ASSOCIATION

The Connecticut Hospital Association met on June 6, 1936, at St. Francis Hospital, Hartford. A legislative committee was appointed consisting of Oliver H. Bartine of the Bridgeport Hospital, Joseph W. Hinsley, Assistant Superintendent of the Hartford Hospital, and Mande E. Wise of Winsted.

The morning session opened with a demonstration of the Formula Room of the hospital by Sister Catherine Teresa Rodgers. Michael A. Connor, State Commissioner of Motor Vehicles, addressed the group on the subject, The Promotion of Safety on the Highways. At the afternoon session, Edwin A. Salmon of New York City, a hospital architect, presented a Comment on Modernization of Hospital Plants. This was followed by a round table discussion led by Dr. Allan Craig, Superintendent of the Charlotte Hungerford Hospital, Torrington. Mr. Salmon emphasized the point that hospital architects find that it is necessary to watch carefully lest laymen spoil the job of hospital planning. He felt that a preliminary study of any hospital job is absolutely

larger cities have the machinery, and most of them have had the wit to insist upon the pasteurization of all milk (except certified), entering them. The difficulties of enforcement, as well as the technical difficulties of pasteurization, are greater in communities served by herds of from one to a few cows. Obviously a farmer with one cow cannot be expected to maintain a pasteurizing machine.

There are many sentimental citizens, however, who are looking back with longing and advocating a return to the horse and buggy days, in a moral sense compatible with modern progress. Let them recall the virtuous period when each farmer took his corn to the mill to be ground, and apply the same pooling of interests to the milk situation. Perhaps then our sore throat epidemics might stretch to a four year cycle, even limiting themselves to the over-worked vocal cords of our political orators, who must be used to them by now.

There is no really acceptable evidence in favor of any raw milk, unless prejudice can pass under the guise of reason. We are willing to commit ourselves to the stand that all milk be pasteurized, with no de luxe exceptions, and finally have done with a needless and exasperating controversy.

## THE INJURIES CAUSED BY EXPLOSIVES

THE usual preliminary accidents due to explosives began in Massachusetts during the celebration of "Bunker Hill Day", when twenty-six patients were given treatment in Boston's hospitals. Probably not all of these sufferers reached the hospitals and therefore the casualty list is not complete.

With the coming Fourth of July the use of explosives by ignorant or careless people will bring many more of these deplorable accidents to hospitals and doctors throughout the state, and if the precedent of former years is followed considerable destruction of property will complicate the situation. Taken all together we pay a high price for celebrating the release of this country from foreign domination. There seems to be a disinclination to change our habits very materially with respect to these hazards.

Fortunately the cessation of the World War has not led to celebrating this great event in the Fourth of July manner to any great extent.

If we do not need to make so much noise and cause so much suffering in celebrating the Armistice of 1918, why do we not try to induce the people of this country to give up the noisy and nerve-wracking customs which have little influence in promoting patriotism and serve no other useful end?

The *Boston Herald* of June 19 has a very strong editorial on this subject.

## THIS WEEK'S ISSUE

CONTAINS articles by the following named authors

COHEN, ETHEL M.S. Director, Social Service Department, Beth Israel Hospital, Boston Address 330 Brookline Avenue, Boston, Mass. Associated with her is

HERRMANN, ROSALIND L. Medical social worker, Beth Israel Hospital, Boston Address 330 Brookline Avenue, Boston, Mass. Their subject is A Social Study of Patients with Chronic Cardiac Disease Treated by Total Thyroidectomy. Page 1.

STEVENS, NEIL C. M.D. Columbia University College of Physicians and Surgeons 1915. His subject is Auscultation of the Abdomen. Page 22. Address Walpole, N. H.

WOODWARD, SAMUEL B. A.B., M.D. Harvard University Medical School 1878. President, Massachusetts Medical Society 1916-1919. His Address at the Annual Meeting of the Boston City Hospital Alumni Association appears on page 26. Address 58 Pearl Street, Worcester, Mass.

BURNETT, FRANCIS LOWELL S.B., M.D. Harvard University Medical School 1906. Assistant Dermatologist and Director of Health Class for Skin Diseases, Massachusetts General Hospital. Assistant in charge of Health Class for Arthritis, Peter Bent Brigham Hospital, Boston. His subject is The Progress of Nutrition. Page 29. Address 205 Beacon Street, Boston, Mass.

## MISCELLANY

### CONNECTICUT NEWS

#### HEART DISEASE AND CANCER TAKE STATE'S BIGGEST TOLL

Fifty years ago tuberculosis, infantile diarrhea and pneumonia were the leading causes of death in Connecticut. In 1935 heart disease, cancer and nephritis were the leading causes in the order named. The general death rate of half a century ago applied to the 1935 population would have brought 29,374 deaths. Actually there were 17,355 deaths, a saving of 12,019. The director of vital statistics reports that heart disease is the only one of a dozen causes of death that has increased through the years. Tuberculosis, diarrhea and diphtheria have steadily decreased.

On June 1, 1936 Dr. John T. Winters and Dr. Francis L. Lundborg were appointed police surgeons of West Hartford to fill the vacancy caused by the resignation of Dr. F. Earle Kunkel. Dr. Kunkel leaves for Philadelphia June 15 to take a three years course in dermatology at the University of Pennsylvania School of Medicine. Following this he expects to return to West Hartford. Dr. Winters served his internship at St. Francis Hospital, Hart-

## THE TALE OF THE CANDID DRUGGIST

Editor, *New England Journal of Medicine*,

The following quotation is from "Land of the Free" by Herbert Agar Houghton Mifflin Company, Boston 1935 It is, I think interesting to note that the incident happened in Boston

Leaving the Boston club on the morning I overheard this conversation, I crossed the street to a drugstore to buy some hair tonic It was a small shop a survival from the days when a chemist sold no books no lingerie, no stationery no food I asked the proprietor to recommend a hair tonic

No' he said

'You have no hair tonic'

Yes he said getting quite talkative, I have'

'Well which do you recommend'

I don't' he said patiently recommend any hair tonic'

You mean you have only had ones'

No— I doubt if they're all bad exactly He opened a glass case and took out a small bottle 'Here's one I put up myself. So at least I know it's harmless And you don't have to pay ten times what it's worth' He looked at the bottle sadly 'But I certainly wouldn't recommend it

'Why not' I asked

'Because I can't see what good it can do Unless you just want something to hold your hair in place

Is that true of all tonics? I asked, naming a couple of well known brands

Oh no he said Those are definitely harmful

So I left without buying anything, but with the growing feeling that there are still plenty of Americans who do not think solely of pushing ahead in the world

Very truly yours

WM PEARCE COUES M.D

Prout's Neck, Maine,

June 21 1936

## RECENT DEATHS

TRESILIAN—FLORENCE H TRESILIAN M.D. of Hudson Massachusetts died at the Flower Hospital New York June 26, 1936 Dr Tresilian was born in 1856 and graduated from the Boston University School of Medicine in 1895

She was formerly connected with the medical staffs of the Taunton and Gardner State Hospitals

Dr Tresilian is survived by three sons T Harvey of Hudson Mass John P of New York City and Guv H of Boston Mass She was the widow of Thomas Tresilian former business editor of the *Boston Transcript*

KELLY—GEORGE GOVE KELLY M.D., a retired physician of 37 Chestnut Place, Brookline Massachusetts and formerly of Hingham, died at the Springfield Hospital June 27 1936

Dr Kelly was born in 1874 and graduated from the Hahnemann Medical College and Hospital of Chicago in 1908 and served on the staff of the Boston State Hospital for several years

Early in his career Dr Kelly practiced for a time in Vermont and served as President of the Vermont State Homeopathic Society

His widow Mrs Frances G Kelly survives him Dr Kelly was a 32nd degree Mason

WILLIAMS—FRANCIS HENRY WILLIAMS M.D., of 505 Beacon Street, Boston, died at the Phillips House June 22 1936

Dr Williams was born in Uxbridge Massachusetts in 1852 and graduated from the Massachusetts Institute of Technology in 1873 After returning from a visit to Japan he entered Harvard Medical School and graduated therefrom in 1877 He then studied abroad for two years and on his return to America engaged in practice in Boston

Throughout his career Dr Williams was an ardent investigator of the possibilities of the useful application of the x ray and radium to medicine and contributed papers on these and other important therapeutic agencies He was credited with the very early use of diphtheria antitoxin

He was a member of the Staff of the Boston City Hospital a Fellow of the Massachusetts Medical Society the American Medical Association and the American Academy of Arts and Sciences In 1918 he was elected president of the Society of American Physicians and was a life member of the Corporation of the Massachusetts Institute of Technology and for many years served on the Executive Committee

FALLON — MICHAEL FRANCIS FALLON M.D. of Worcester Massachusetts died at his home, June 24 1936

Dr Fallon was born in Worcester in 1863 Before studying medicine he graduated from Holy Cross College in 1883 and from the Harvard Medical School in 1887 subsequently studying abroad for two years before entering practice in Worcester During his early practice he continued the study of pathology at the Harvard Medical School as the exigencies of practice permitted With the founding of St Vincent Hospital Dr Fallon was appointed to its staff, and in 1908 was advanced to the position of chief surgeon

He was a Fellow of the Massachusetts Medical Society a member of the Council for many years, a former Vice-President and a former President of the Worcester District Medical Society For several years up to the time of his death, he was chairman of the Committee on Funds of the last designated body Ex-Governor Walsh appointed Dr Fallon to membership on the State Board of Registration in Medicine in 1915 where he served the State for the succeeding seven years His other medical interests consisted of Fellowship in the American Medical Association membership in the American College of Surgeons and the New England Surgical Society

Dr Fallon is survived by his widow Mrs Ella J (Ford) Fallon and a son Dr John M Fallon who

essential before a hospital is built or even an annex added to one already standing Dr Albert W Buck, Superintendent of the New Haven Hospital and president of the Connecticut Hospital Association, presided at the meeting Dr Lewis Sexton Superintendent of the Hartford Hospital and Dr Allan Craig are members of the Executive Committee of the Association

About four hundred men and women attended a banquet on June 7 at the Hotel Bond Hartford in honor of Dr Joseph S Paladino who had been nominated to the Knighthood of the Crown of Italy Object of a hundred compliments for his service among the Italians here and abroad in his native Florida, Dr Paladino received, amid applause the cross of the order of Cavaliere della Corona d Italia, pinned on him by Cavaliere Pasquale De Cicco of New Haven Italian Royal Vice Consul Dr Paladino was presented by his friends with many gifts including medical and surgical instruments

Dr George E Ober, former president of the Bridgeport Board of Health and prominent as a physician in that city for forty five years died June 11, 1936 at the Bridgeport Hospital following a brief illness

**WOLFF**—ARTHUR JACOB WOLFF, M D died in Hartford Connecticut, June 22 1936, aged 81 years Dr Wolff was the bacteriologist of the Hartford Health Department He retired from active practice about five years ago, but had continued research and was a recognized expert in testimony in murder cases

Dr Wolff had served on the staff of St Francis Hospital and that of the Mount Sinai Hospital and after 1908 had served on the State Board of Health for many years

Dr Wolff was born in London England the son of Arthur S Wolff, M D and Sarah Anseli Wolff He graduated from the Texas Medical College in 1876 For one year he practiced in Galveston and was assistant surgeon at the U S Army post at Fort Brown.

After coming North in 1881 he studied at Bellevue Hospital New York and received an M D degree in 1883 He was a member of the New York City County and State Medical Societies and the Royal Microscopic Society of London

Dr Wolff is survived by his widow and a son Arthur S Wolff, 2nd

#### HEALTH OFFICERS MONTHLY STATEMENT OF VENEREAL DISEASES REPORTED IN THE NEW ENGLAND STATES

APRIL, 1936

This statement is issued monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases The following reports were received from State Health Officers The figures are preliminary and subject to correction It is hoped that this will stimulate more complete reporting of these diseases

State	Syphilis		Gonorrhea	
	Cases Re-ported Dur-ing Month	Monthly Case Rates per 10 000 Popu-lation	Cases Re-ported Dur-ing Month	Monthly Case Rates per 10,000 Popu-lation
Connecticut	165	1 00	86	52
Maine	33	41	46	.57
Massachusetts	514	1 19	486	1 12
New Hampshire	15	32	19	40
Rhode Island	130	1 84	56	79
Vermont	21	58	21	.58

*Treasury Department—U S Public Health Service*

### CORRESPONDENCE

#### REDUCING A DISLOCATED FEMUR IN NEW FOUNDLAND—DR FITZGERALD'S INGENUITY

*Mr Editor*

The following is from 'The 'Albatross' a most interesting account of the medical work of Conrad Fitzgerald in Newfoundland written by Conrad Tre-lawney Fitzgerald Jr, published by J W Arrow smith, Ltd, Bristol England, 1935

"On arriving at Harbour Breton he found that a man from the 'room had fallen from a vessels mast and dislocated his thigh The patient was a huge strongly built fellow and the doctor realized that he might have some difficulty in replacing the bone After some consideration he at last devised a plan which happened to prove even more successful than he had dared to hope On the fish flakes which belonged to the firm a miniature railway had been built This consisted of iron rails upon which ran flat trucks about six feet in length. The trucks were used to convey fish to and from the flakes On one of these the patient was laid and wheeled to a place between two vertical beams, one on either side of the track. The next step was to administer chloroform after which a canvas band was adjusted above the knee of the injured member The truck was placed so that the beams were about four feet from the patient's feet A tackle was now brought one end of which was fastened to the middle of a cross-beam which had been nailed to the uprights The other end was attached to the canvas band Having blocked the wheels several volunteers at a signal from the doctor now began to pull steadily until the dislocated limb was the same length as the other The doctor then quickly fastened a strap just above the canvas band, and by leaning strongly away from the patient's body and at the same time manipulating the head of the bone the latter went back with a very audible 'snock.'

Yours truly,

WM PEARCE COUES M D

Prout's Neck, Maine  
June 25, 1936

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## FLUID THERAPY IN SURGERY A CRITICAL REVIEW\*

BY JOHN D. STEWART, M.D.†

THE subject of water balance is appearing with increasing frequency in present medical literature and interest in studying this widely important subject is now very properly being shown by the clinician as well as the physiologist and biochemist. All patients who are very sick are actual or potential problems in disturbed water and salt metabolism. The following discussion is presented in the hope that it will be useful to the clinician in dealing with the problem in fluid therapy, for there is still much variable and uncritical practice in treating such patients. This paper embodies principles and practices in active acceptance on the Surgical Services of the Massachusetts General Hospital and makes no pretense of being final or exhaustive. Inasmuch as general principles are being discussed rather than specific contributions, no bibliography is appended. Those interested may find an excellent list of references to pertinent work on water metabolism in the book, "Body Water", by J. P. Peters (Charles C. Thomas, 1935).

The fluids of the human body, which comprise roughly 70 per cent of its weight, may be considered as occupying three reservoirs, namely the blood vessels, the interstitial areas and the cells. The blood vessels contain fluid amounting to about 9 per cent of the body weight; the interstitial areas (not including the blood) hold fluid approximating 16 per cent of the body weight, while the fluid within the cells throughout the body comprises 45 per cent of the body weight. The fluid of the body, whether in the blood stream, the interstitial reservoir or the cells, contains a constant proportion of salts and this content of salt must be kept invariable within narrow limits or serious symptoms and death result. This proportion of salts is equivalent to 0.9 per cent sodium chloride solution, the so-called "physiological salt solution". The chief salts making up the salt content of the blood plasma and interstitial fluid are sodium chloride and sodium bicarbonate, while the chief ions within the cells are potassium and phosphate.

Not only must the total concentration of the salts in the body fluids be kept constant but

their normal relative quantities must be maintained. An abnormal increase or decrease in the alkaline salt sodium bicarbonate, for instance, at the expense of the neutral salt sodium chloride will cause a change in body fluid reaction, i.e. alkalosis or acidosis. Therefore, in viewing derangement of body fluids there are three important considerations, namely, the total amount of fluid; secondly, the proper concentration of salts; and thirdly, the proper balance between acid and base. It is important to remember that the measurement of the concentration of an ion, such as sodium, chloride or bicarbonate in the blood is an expression only of the proportion of the substance in relation to water, and gives no clue as to whether its total amount in the body is increased or decreased.

It is the function of the kidney to stand guard over the body fluids and effect the proper regulation of these factors. If too much salt is ingested the excess is promptly excreted in the urine, and if either acid or base tends to predominate in the body fluids, the kidney helps to restore the balance by forming an acid or alkaline urine depending on the need. This regulation of the amount and electrolyte pattern of the body fluids is perhaps the most pressing office of the kidney, and in fluid therapy a normal kidney may be relied upon to retain what the body needs and excrete the excess.

The proteins of the plasma constitute another factor to be considered in fluid metabolism. It is due to the osmotic pressure of these colloid substances that fluid is kept within the capillaries in balance against the force of the blood pressure. The normal level of plasma proteins is 6.5 to 7.5 per cent. If the proteins become lowered below approximately 5 per cent, as from chronic malnutrition, or from loss in large draining wounds or through the excretion of protein by the kidneys in nephrosis, generalized edema may result. Other factors of importance in the regulation of body fluid are blood pressure and capillary and cell wall permeability. In a general way one might say that the circulation of the blood, the plasma proteins and the condition of semipermeability of capillary and cell wall have to do with the distribution and proper partition of fluid within the organism while the kidney through the medium of

\*From the Surgical Services of the Massachusetts General Hospital.

†Stewart, John D.—Assistant in Surgery and Dalton Scholar, Massachusetts General Hospital. For record and address of author see "This Week's Issue" page 2.

was associated with his father in the practice of surgery

## NOTICES

### AMERICAN CONGRESS OF PHYSICAL THERAPY

Announcement is made of the fifteenth annual clinical and scientific session of the American Congress of Physical Therapy, September 7, 8, 9, 10 and 11, at The Waldorf Astoria, New York City. The program includes many special features: sectional meetings in the specialties; symposia on short wave diathermy, hydrotherapy, exercise and electroresection. Fever therapy and the treatment of vascular diseases occupy an important place and will be discussed by prominent workers in the field. The educational aspects of physical therapy and the relationship of physical therapy technicians to physicians and hospital departments will be thoroughly dealt with. Other features include technical and scientific exhibits and a full day of hospital clinics where technique will be adequately demonstrated.

Physicians, their technical assistants, and nurses working in institutional departments of physical therapy are urged to attend this important session. It undoubtedly will be one of the outstanding medical gatherings of the year. There will be no registration fee.

## REMOVAL

NATHAN GORN, M.D., announces the removal of his office to 479 Beacon Street, Boston. Telephone Kenmore 8000.

### FIRST INTERNATIONAL CONFERENCE ON FEVER THERAPY

#### POSTPONEMENT NOTICE

The First International Conference on Fever Therapy originally scheduled for the end of September, 1936, has been postponed because of numerous requests, to permit more time for the preparation of material. The new dates set for this Conference are March 30 to April 2, 1937. The sessions will be held at the College of Physicians and Surgeons, Columbia University, New York City.

The advances in the treatment of gonorrhea, syphilis, and other diseases by pyretotherapy are of great social significance.

A tour has been arranged to take place immediately following the Conference to enable physicians to observe the techniques employed in fever therapy in some of the hospitals in the eastern section of the United States. Among the institutions to be visited are the Strong Memorial Hospital of the University of Rochester, New York; the Henry Ford Hospital, Detroit; the Mayo Clinic, Rochester, Minnesota; the Kettering Institute for Medical Research at the Miami Valley Hospital, Dayton; Northwestern University Medical School, Chicago.

Further information regarding the Conference may be obtained from the General Secretary, Dr. William Bierman, 471 Park Avenue, New York City.

## REPORT OF MEETING

### THE ANNUAL MEETING OF THE AMERICAN DERMATOLOGICAL ASSOCIATION

The American Dermatological Association held its sixtieth annual meeting at the New Ocean House, Swampscott, Mass., on June 4, 5, and 6, 1936. This was the fifth meeting held in Boston, the last meeting being in 1921. The officers at this meeting were: President, Dr. C. Guy Lane, Boston; Vice President, Dr. Dudley C. Smith, University, Va.; Secretary, Dr. Fred D. Weidman, Philadelphia.

The meeting began with a clinic at the Massachusetts General Hospital on Wednesday afternoon, June 3, and scientific sessions were held at the New Ocean House on the three following days. Twenty-six papers on cutaneous diseases and syphilis were presented at these meetings.

Eighty-two members of the Association from all parts of the United States, Canada, and Cuba were present. This was one of the largest meetings ever held. The Association was entertained at the Pops on Friday evening, June 5.

The officers for next year were elected as follows: President, Dr. John H. Stokes, Philadelphia; Vice-President, Dr. E. Lawrence Oliver, Boston; Secretary, Dr. Fred D. Weidman, Philadelphia. Philadelphia was selected as the next meeting place.

### SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

#### CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, JULY 6, 1936

##### Wednesday, July 8—

112 m. Clinico-Pathological Conference, Children's Hospital.

##### Thursday, July 9—

\*8:30-9:30 a.m. Clinic, Surgical Staff of the Peter Bent Brigham Hospital at the Peter Bent Brigham Hospital.

##### Saturday, July 11—

\*10 a.m.-12 m. Staff Rounds at the Peter Bent Brigham Hospital, Conducted by Dr. Samuel A. Levine.

\*Open to the medical profession.

†Open to Fellows of the Massachusetts Medical Society.

August 24-29—Harvard University Tercentenary Celebration. See page 1166, issue of June 4.

September 1936—First International Congress of Sanatoria and Private Nursing Homes. See page 803, issue of April 16.

September 7-10—International Union against Tuberculosis. See page 554, issue of March 12.

September 7-11—American Congress of Physical Therapy. See notice elsewhere on this page.

September 14 and 16—Tercentenary Session of the Harvard Medical School. See page 1166, issue of June 4.

October 12-18—Third International Congress on Malaria. See page 1076, issue of May 21.

October 19-23—Clinical Congress of the American College of Surgeons. See page 180, issue of January 23.

October 19-31—1936 Graduate Fortnight of the New York Academy of Medicine. See page 1221, issue of June 11.

October 20-23—The American Public Health Association. See page 1225, issue of June 11.

March 30-April 2, 1937—First International Conference on Fever Therapy. Postponement notice. See notice elsewhere on this page.

April 21-24, 1937—American Society for Experimental Pathology. See page 1075, issue of May 21.

icaine and ranks with anesthesia and asepsis as a life saving measure. The variety of fluids which may be given by vein is great, for dilution of the injected fluid is instantaneous. Hypertonic fluids such as 5 per cent sodium bicarbonate solution, 50 per cent glucose solution and 50 per cent sucrose solution and hypotonic fluids, even distilled water, may be given by vein, although the last is, of course, never to be used in fluid therapy. In addition, alkaline and acid fluids may be infused directly into the blood stream when needed. Sterile technique is necessary, of course, and the speed of the injection must be controlled. At least thirty minutes should be taken in giving a liter of fluid, and ordinarily the slow, gravity-drip technique is to be preferred. By splinting the extremity to avoid having the needle dislodged, fluid may be allowed to flow into a vein without stopping for as long as four or five days, the rate of flow being kept constant. When veins are small and obscured by fat, it is at times necessary to expose them under local anesthesia and tie a cannula in place.

#### *Types of Fluid Used in Fluid Therapy*

Concerning water itself as given by mouth or by rectal injection, nothing need be said except that water alone, without salt, will not repair dehydration.

1 **Physiological salt solution.** This solution consisting of 0.9 per cent sodium chloride is perhaps the most generally useful. It is isotonic with the blood and neutral in reaction and may be given by any of the methods discussed. Sodium chloride is absolutely indispensable in the repair of dehydration, owing to the need for maintenance of the proper salt concentration in the body fluids. In fact, one may see the paradoxical spectacle of dehydration with diuresis where water without sodium chloride is taken in quantity by a dehydrated animal, for the kidney promptly excretes the excess water in order to avoid having the salts of the body diluted to a dangerous degree. In giving physiological salt solution we must keep in mind the fact that this fluid is readily retained to the point of producing edema, and the amount given should not be greatly in excess of the body need.

2 **Glucose solutions.** Isotonic (5 per cent) glucose solution may be given by vein or by hypodermoclysis, while hypertonic glucose solutions, such as the 10 per cent, 20 per cent, or 50 per cent solutions, must be given only by vein, for they are highly irritating to the tissues. Hypertonic glucose solutions are prone to evoke thrombosis of a vein at the point of injection unless mechanical trauma of the vein is avoided and the venous flow is rapid. Glucose is rapidly taken up by the liver and mus-

cles after injection into the blood stream and is converted into glycogen or oxidized within a few hours. This leaves its water of solution free for elimination by the kidneys, and hence isotonic glucose solution has a diuretic effect. This diuretic effect is much to be desired at times in the oliguria of dehydration, for effective renal function is thus promoted. Hypertonic glucose solutions have an even greater diuretic effect, but are undesirable in treating dehydration since their first effect is to abstract water from cells already dehydrated.

A question of some interest is whether to give insulin in the nondiabetic when glucose solutions are being given intravenously. The weight of evidence seems to indicate that if 5 or 10 per cent glucose solution is given at a properly slow rate the nondiabetic needs no supplement of insulin in utilizing the glucose.

3 **Glucose in physiological salt solution.** A 2½ per cent, 5 per cent, or 10 per cent solution of glucose made up with 0.9 per cent sodium chloride may be useful for intravenous injection, since water, glucose and sodium chloride are all supplied. Such solutions are hypertonic, and thus are best given intravenously, rather than interstitially. Their hypertonicity also renders such solutions less desirable in severe dehydration since their immediate effect would be to abstract water from cells.

4 **Sucrose solution.** 50 per cent. This strongly hypertonic, nontoxic solution may be given intravenously for the purpose of lowering intracranial pressure. Sucrose given by vein is quantitatively excreted through the kidneys, and thus has a strong diuretic effect. It possesses a great advantage over 50 per cent glucose solutions in lowering intracranial pressure in view of the fact that sucrose does not diffuse into the cerebrospinal fluid as does glucose with the production of a secondary rise in cerebrospinal fluid pressure.

5 **Sodium bicarbonate solution,** 5 per cent. Occasionally in treating severe acidosis with dehydration, as in diarrheal disease in infants and in diabetic acidosis, it is advisable to give sodium bicarbonate solution intravenously, as well as physiological salt solution. A solution of 5 per cent sodium bicarbonate in water is hypertonic and alkaline and must be given by vein rather than into the tissues. The great disadvantage that this solution has is the difficulty in sterilization. When heated, such a solution loses CO<sub>2</sub> and becomes changed into the very alkaline, toxic sodium carbonate. Therefore, unless special technique for sterilizing sodium bicarbonate solutions is available, these solutions can be given only without formal sterilization. Sodium bicarbonate may be taken from a fresh bottle of the chemically pure reagent with a sterile teaspoon and added directly to



the circulation, is concerned with maintaining the constancy of its composition and volume

#### *Routes Available in Fluid Therapy*

1 By mouth This route is adequate in healthy people and in most of the sick. There are certain circumstances, however, which make it necessary to resort to other channels. Some of these conditions are the following: (a) Organic disease of the gastrointestinal tract or peritoneum, in association perhaps with nausea, vomiting or diarrhea. (b) Functional derangement of the gastrointestinal tract, as in pernicious vomiting of pregnancy and many conditions in children, who may develop diarrhea and vomiting during the course of remote infections, such as otitis media. (c) Inability of the patient to cooperate, as in conditions of delirium or coma, and in infants. (d) Urgent conditions, wherein fluids are needed immediately and it is inadvisable to wait for possibly uncertain absorption from the intestinal canal, as in severe diabetic acidosis. (e) Conditions such as hemorrhage, shock, sepsis and chronic malnutrition in which blood is needed and must be given by vein. Also, if sodium chloride or sodium bicarbonate is needed, these are unpalatable to the sick. A procedure which is useful at times, as in partially occlusive lesions of the esophagus, is the administration of fluids through a rubber tube of calibre 12 or 14 French, introduced through the nose into the stomach. Such an intubing tube may be left in place for days and large quantities of water and nutrient materials may be introduced directly into the stomach or duodenum, using, if need be, a constant drip flow. Such a tube is likely to become irritating to the nasopharynx, however, and an uncooperative patient may refuse to leave it in place.

2 By rectum Large quantities of water and physiological salt solution may be absorbed from the colon when introduced through the rectum. Experimental evidence tends to show that glucose is not absorbed from the colon, although variable quantities may be absorbed from the terminal ileum after regurgitation through the ileocecal valve. Glucose has the disadvantage that it may undergo fermentation in the colon and produce irritation leading to expulsion of fluid given subsequently. There seems to be no conclusive evidence that nutrient substances are ever absorbed from the colon itself. At any rate no hypertonic fluids should be administered by proctoclysis in dehydration, and if glucose is given it should be in 5 per cent solution. Fluids introduced into the colon through proctoclysis may be given in eight or ten ounce quantities in the adult every four hours, or the constant drip method, as originally popularized by Murphy, may be used. The disadvantages of this means of giving fluid to a patient are the rather slow and uncertain ab-

sorption, and the limitation of the type of fluid which may be given. However, in case of limited facilities and help, proctoclysis may be an invaluable method of supplying water, salt and heat to a sick patient.

3 Hypodermoclysis This is one of the most useful methods in fluid therapy. Absorption is fairly rapid and is certain. Sterilized fluid must be given, of course, with aseptic technique. The bilateral subpectoral injection, using gravity force and allowing the fluid to run into the tissues slowly, may be used. An alternative site, indicated especially in conditions involving embarrassment of respiration, is the subcutaneous tissues of the inner or outer aspect of the thighs. Only fluids isotonic with the blood, or slightly hypertonic, should be given by hypodermoclysis, i.e., 0.9 per cent sodium chloride, 5 per cent glucose solution, 2½ per cent glucose in 0.9 per cent sodium chloride solution, or Ringer's solution. The skin at the point of insertion of the needle may be novocainized, and if desirable in further preventing discomfort, novocain may be added to the fluid being given in proportion of 300 milligrams per liter of fluid. In an adult patient a daily hypodermoclysis of up to two liters, may be given for several days. In a patient whose circulation, renal function and serum proteins are not deranged, sluggish absorption of fluid given by hypodermoclysis is evidence that an excess is being given.

The limiting factors in this mode of supplying fluid to the body are the discomforts produced by distention of tissues, even though slowly done, and the limitation of the kind of fluid which may be given. Sodium bicarbonate solution, the more concentrated glucose solutions, and, of course, blood cannot be given in this way.

4 Intraperitoneal injection Physiological salt solution, 5 per cent glucose solution, Ringer's solution, and even whole blood, may be introduced into the peritoneal cavity, from which absorption may be rapid. This technique has been used particularly in infants whose veins are small and whose tissue areas may not be large enough to make hypodermoclysis practicable. Although the availability of this method is to be borne in mind, the procedure should rarely be resorted to, for it carries with it the danger of infection and traumatization of viscera and peritoneum. Absorption may be uncertain, particularly in the case of glucose solution or blood, and intractable distention of the abdomen has been observed as a sequel. Even the injection of physiological salt solution has been shown to evoke a richly cellular peritoneal exudate, the importance of which in the production of adhesions may be considerable.

5 Intravenous infusion This therapeutic procedure is one of the most valuable in med-

not infallible evidence that dehydration is not present. In addition, the specific gravity of the urine is important and if the specific gravity is below 1.015, as pointed out by Collier and Maddock, dehydration is not likely to be present (except in specific disease of the kidney).

Information pointing to the existence of dehydration is obtained if the clinical signs of alkalosis or acidosis are present, for, although dehydration may occur without disturbance of acid base equilibrium, severe acidosis or alkalosis always implies dehydration. The deep forcible breathing of acidosis or the shallow breathing, increased muscular irritability, tremors and cramps of alkalosis or the strong odor of acetone on the breath, all indicate the need for specific fluid therapy.

Indirect evidence concerning the state of hydration of the body can be obtained by measuring during the twenty-four hour period the total amount of fluid taken into the body, and balancing this against the fluids lost, whether through urine, stool or vomitus.

Blood chemistry determinations may provide both direct and indirect evidence of body fluid concentration. In the early stage of dehydration when the loss is at the expense of interstitial and intracellular fluids no direct evidence can be obtained by chemical examination of the plasma. In the advanced stage of dehydration, the volume of the blood plasma is reduced, and this is indicated by an increase in the concentration of nondiffusible elements in the blood, namely, plasma proteins, red blood cells and hemoglobin. Also in severe dehydration, there is, as has been mentioned, impairment of renal function. In the presence of circumstances tending to cause dehydration, elevation of blood urea nitrogen above 30 mg per cent or of nonprotein nitrogen above 40 mg per cent is evidence of dehydration of advanced degree. Changes in plasma bicarbonate and plasma chloride from their normal values may be taken as indirect evidence of dehydration, inasmuch as these changes are commonly caused by the same processes which produce dehydration. Moreover, these changes in bicarbonate and chloride begin in the early stage of dehydration and are for this reason very useful evidence.

Summary of blood plasma values in dehydration

*Sodium*—normal, 140-144 milliequivalents per liter

In spite of the progressive loss of sodium from the body in dehydration the parallel loss of water tends to keep the concentration of sodium in the plasma nearly normal so long as renal function is accurate. With the development of impaired renal control in advanced dehydration values either above or below the normal may be found. A relative increase in sodium concentration as compared with chloride means alkalosis; a relative decrease in

acidosis; provided there is not an accumulation in the plasma of other acid substances such as organic acids, phosphate and sulphate.

*Chloride*—normal, 100-106 milliequivalents per liter

The direction of change in the chloride value depends on the underlying process causing the dehydration. If the major cause is continued loss of gastric secretions, very extensive reduction in chloride may be found. In the presence of other causes of dehydration, chloride may be found at its usual value or somewhat elevated. Reduction of chloride as compared with sodium usually indicates alkalosis and an increase acidosis.

*Bicarbonate (CO<sub>2</sub>)*—normal 24-28 milliequivalents per liter (55-65 vol per cent)

Bicarbonate change is always secondary to change in other plasma factors especially to alteration in concentration of sodium and chloride. As noted above, increase in sodium tends to cause increase in bicarbonate, and reduction of sodium a fall in bicarbonate. Chloride change causes an inverse change in bicarbonate, reduction causing increase in bicarbonate and extension decrease.

*N P N*—normal, 20-30 mg per cent

In severe dehydration retention of nonprotein nitrogen develops as a consequence of impairment of renal function caused by reduction of volume flow of blood through the kidney.

*Plasma protein*—normal, 6.5-7.5 Gm per cent

A rise in concentration of the plasma proteins is found in advanced dehydration and indicates a reduction of blood plasma volume.

*Plasma volume*—normal, 50 cc per kg of body weight

Reduction of blood plasma volume is an eventual result of the process of dehydration. The presence of a decreased value for plasma volume indicates that interstitial and intracellular fluid reserves have been exhausted and that an advanced and dangerous degree of dehydration has been reached.

In treating dehydration, each case is an individual problem and rule-of-thumb procedure is undesirable. Certain general ideas are acceptable, however, and the most immediate concern is the function of the kidney. If anuria or oliguria is present, renal excretion should be stimulated so that the kidney may eliminate accumulated catabolic substances and any excess of acid or base, and for this purpose 5 per cent glucose solution in distilled water given intravenously is useful. At the same time physiological salt solution may be given by hypodermoclysis.

Usually the acidosis or alkalosis of dehydration responds to the same treatment. The essential elements of sodium, chloride and water the kidney retains in quantity and proportion as needed, once renal function is active. At times, however, acidosis or alkalosis may be so severe, that corrective fluids must be given specifically with acidosis or alkalosis in mind. Ordinarily, the flow of urine should first be started by the intravenous infusion of 5 per cent glucose solution. Acidosis may then be treated by the intravenous administration of 5 per cent sodium bicarbonate solution, or by the intravenous or interstitial injection of 1.8 per cent sodium lac-

a flask of glucose solution or physiological salt solution, which is to be given intravenously, in the proportion of one or two teaspoonfuls per 500 cc of fluid. Although this practice has the sanction of extensive use, it cannot be wholly commended.

6 Sodium lactate solution 1.8 per cent (1/6 molar). The use of this fluid as a substitute for sodium bicarbonate solution, has been extensively advocated by A. F. Hartmann. It has the advantages of being isotonic and neutral, permitting interstitial as well as intravenous administration. In addition, its alkalinity results from the gradual conversion of lactate to glucose in the body, the glucose being available to meet the body's need. As one of the fluids used in the treatment of dehydration with acidosis, supplementary to physiological salt solution, this fluid has real merit, particularly in children, in whom interstitial injection may be desirable. Sodium lactate solution is contraindicated in dehydration with alkalosis.

7 Acacia solution. This solution, consisting, as usually given of 6 per cent gum arabic (U.S.P.) made up in 0.9 per cent sodium chloride solution, has a limited usefulness in the treatment of conditions of acutely reduced blood volume, such as shock and hemorrhage, when blood transfusion cannot immediately be done. Acacia forms a colloidal solution which leaves the blood stream very slowly and therefore tends to hold fluid in circulation. It should be run into a vein slowly, not exceeding 20 cc per minute. Dangers are, injury to the hepatic parenchyma with enlargement of the liver and diminished excretion of bile salts and pigment and diminution in urine volume. Repeated injections are much more apt to cause harm, particularly from depression of serum proteins and damage to the polygonal cells of the liver. In an emergency, however, when it is not possible to give a blood transfusion immediately, the intravenous injection of acacia solution may be regarded as a temporary substitute. Its use is more justifiable in shock than in severe hemorrhage.

8 Blood. Blood as given in transfusion is obtained from a compatible donor and is injected in quantities varying from 400 to 1200 cc in the adult. Whole, unmodified blood may be given from a paraffinized container in a technique rapid enough to avoid clotting, or, blood may be citrated and injected more slowly. Citrated blood is somewhat more likely to produce untoward reactions, but possesses the advantage of being much simpler to give. Indeed, such blood may be infused into a vein using the ordinary intravenous infusion technique and may be allowed to run in quite slowly. Blood which has been defibrinated, as by stirring or shaking with glass beads in order to re-

move the elements of the clot, should never be used for transfusion, since toxic substances are formed in such traumatization. This is one of the reasons why autotransfusion of blood which has collected in the peritoneal cavity is undesirable.

In general, the conditions in which fluid therapy is necessary are as follows:

#### I Dehydration

- (a) Without acidosis or alkalosis
- (b) With acidosis
- (c) With alkalosis

#### II Conditions requiring blood transfusion

- (a) Acutely reduced blood volume
- (b) Chronic anemia
- (c) Lowered serum proteins
- (d) Severe infections, acute or chronic
- (e) Disease in which there is abnormal tendency to bleed

#### III Conditions to be treated with hypertonic fluid therapy

*Dehydration.* Dehydration occurs when the intake of water and salts is insufficient, or when there is abnormal loss of body fluid, whether from vomiting or diarrhea or through the skin and lungs. Dehydration may be unaccompanied by acidosis or alkalosis, as exemplified by the dehydration of excessive sweating and some cases of severe diarrhea. Usually, however, in severe dehydration there is concurrent disturbance of the acid-base equilibrium in the body. A predominant loss of acid gastric juice, as in pyloric obstruction, leads to dehydration with alkalosis, a loss particularly of alkaline upper intestinal secretions, or strongly alkaline biliary and pancreatic secretions, leads to dehydration with acidosis. The accumulation of abnormal acids in the body, such as the ketone bodies, also leads to acidosis. The retention of sulphate, phosphate, and the radicals of organic acids with production of acidosis is a common event in renal disease. It also occurs in the advanced stage of dehydration as the result of impairment of renal function due to reduced volume-flow of blood through the kidney.

In estimating the state of dehydration in a patient, a great deal can be learned from simple, direct observations. The facial appearance of the patient, the degree of thirst, the dryness of the buccal mucosa and tongue, the turgidity of the skin and subcutaneous tissues are helpful. In examining the mucous membranes of the mouth the condition of the mucosa inside the upper and lower lips, which are less readily dried out by mouth breathing, is significant. Further evidence easily obtained and of much importance is the quantity and nature of the urine excreted during twenty-four hours. In the absence of diabetes insipidus or diabetes mellitus and severe nephritis, a daily output of over 1500 cc urine is strongly presumptive but

tate solution. It is to be borne in mind that the administration of such alkaline fluids is only a part of the treatment of dehydration with acidosis, and is to be followed by physiological sodium chloride solution. Sodium bicarbonate and sodium lactate solutions may combat acidosis, but they cannot repair dehydration, since they do not contain the essential chloride ion in addition to sodium. Alkalosis may ordinarily be treated in the presence of active renal function by the administration of physiological salt solution, for this solution, compared with the plasma, actually contains an excess of the acid chloride.

In determining the amount of fluid to be given daily in treating dehydration we are guided by the general condition and appearance of the patient, the age and weight of the patient, the balance of intake and output, the quantity and specific gravity of the urine and repeated blood chemistry determinations. As a rule the daily intake of fluid in an adult should exceed the measurable output by at least 2000 cc, for an average loss of two liters a day takes place insensibly through skin and lungs. If perspiration is excessive, this loss is much increased. The fluid intake should be sufficient to permit the urine volume to be at least 1500 cc per day in the adult. Should a patient become edematous during restorative fluid therapy, less fluid should be given and 5 per cent glucose instead of physiological salt solution is indicated.

*Conditions requiring blood transfusion.* Concerning the rather special indications for fluid therapy as seen in the need for transfusion of blood, little will be said in this paper. In conditions of acutely reduced blood volume such as hemorrhage and shock, blood transfusion is specific treatment. Other conditions in which blood transfusion may be of benefit, such as severe burns, deficiency of plasma proteins by polychromic anemia, sepsis and hemorrhagic tend-

ency are rather apart from the scope of the present discussion.

*Hypertonic fluid therapy.* This phase of fluid therapy requires brief discussion. The hypertonic solutions used, such as 25 or 50 per cent glucose, 20 per cent sodium chloride or 50 per cent sucrose must be given carefully by vein. These solutions are highly irritating to the tissues and readily produce sloughing if injected outside the wall of the vein. Veins frequently become thrombosed at the site of injection of such fluids. Of these solutions, 50 per cent sucrose is probably the best. Sucrose when given by vein is a nontoxic substance which does not enter the tissue cells and is excreted quantitatively in the urine along with much water from the tissues. This solution of sucrose possesses a great advantage over hypertonic glucose solution in that intracranial pressure is reduced with much less tendency for a secondary rise to occur. A 50 per cent solution of sucrose may be given intravenously to the extent of 5 cc per kilogram of body weight in the adult at the rate of 10 cc per minute.

The chief field of usefulness of hypertonic intravenous therapy is seen in conditions of increased intracranial pressure following trauma to the skull as in depressed fracture and injury to the brain substance.

*Summary.* A critical discussion of fluid therapy as concerns surgical practice is presented, dealing with the following considerations:

- 1 Basic physiological factors
- 2 Appropriate methods
- 3 Types of fluid to be used
- 4 Indications for the use of fluid therapy, with particular emphasis on treatment of dehydration

A tabulation of pertinent material is contained in table 1.

## ACUTE APPENDICITIS AND MEASLES\*

BY HENRY W HUDSON, JR, M D † AND CECIL KRAKOWER M D ‡

**D**URING a five year period one of us (H W Hudson, Jr) has observed eight cases of acute appendicitis during the course of measles. This unique experience has led us to review the literature and to record our own findings, in order that attention may be called to a curious clinical picture.

In 1901 Williams<sup>1</sup> reported the case of a boy of twelve years who, on the day following the

appearance of a measles rash developed signs of acute appendicitis. He was successfully operated on. The pathologic report by Mallory was that of acute inflammation with a concretions and pus within the lumen of the appendix.

In 1928 Popper<sup>2</sup> reported the case of a man of twenty-six years with signs of acute appendicitis and a white blood cell count of 7,000. Under the operating room lights a measles rash was visible. At operation a thickened, reddened appendix was removed. There was turbid fluid in the iliac fossa. The day following, typical measles was present.

In the same year Fischer<sup>3</sup> from his personal

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TABLE 1

The following table illustrates the types of fluid which meet the various needs in fluid therapy. The dosage recommended is only approximate, and obviously must vary widely with the individual case. These fluids have been found satisfactory in covering all the needs in fluid therapy arising in the care of patients on the Surgical Services of the Massachusetts General Hospital.

Fluid	Nature	Method of Administration	Indications	Dosage First 24 Hours per Kilogram Body Weight
0.9% sodium chloride (Physiological salt solution)	Isotonic, neutral reaction, in vivo yields relative excess of chloride	Proctoclysis Hypodermoclysis Intravenous infusion	Dehydration with or without Alkalosis or acidosis	50-100 cc
5% glucose solution	Isotonic, neutral reaction, in vivo yields free water	Proctoclysis Hypodermoclysis Intravenous infusion	Oliguria of dehydration Ketosis Carbohydrate-lack	10-30 cc
5% glucose solution with 0.9% sodium chloride	Hypertonic, neutral reaction	Intravenous infusion	Dehydration Ketosis	50-100 cc
10% glucose solution	Hypertonic neutral reaction	Intravenous infusion	Ketosis severe Carbohydrate-lack	20-40 cc
50% sucrose solution	Hypertonic, neutral reaction	Intravenous infusion	Increased intracranial pressure	5-10 cc
5% sodium bicarbonate solution	Hypertonic, alkaline	Intravenous infusion	Severe acidosis, supplementary to 0.9% NaCl	5-10 cc
1.8% sodium lactate solution	Isotonic, neutral in vitro, produces alkali in vivo	Hypodermoclysis Intravenous infusion	Severe acidosis supplementary to 0.9% NaCl	10-20 cc
6% acacia in 0.9% sodium chloride	Isotonic osmotic pressure of colloids similar to that of plasma proteins	Intravenous infusion	Shock and hemorrhage (Temporary substitute for transfusion)	10-20 cc
Blood whole or with 0.25% sodium citrate		Intravenous infusion	Hemorrhage Shock Chronic anemia Deficient plasma proteins Acute and chronic infections Hemorrhagic disease	10-20 cc

side The pain persisted and at times was referred to the epigastrium Nine days before admission she vomited twice after meals She ran a fever varying between 101° and 102° Two days before admission there was anorexia and nausea and on one occasion vomiting The day before entry to the hospital the pain was more severe

When admitted she was alert bright and appeared acutely ill The temperature was 100°, the pulse rate 126 and the respirations 25 She lay in bed with thighs flexed There was slight abdominal distention with marked tenderness in the right lower quadrant which was accompanied by muscle spasm A mass about 10 cm in diameter occupied the right lower quadrant and suprapubic region A tender mass was palpable by rectum on the right side of the pelvis

Operation revealed an abscess which had eroded through the transversalis muscle A large amount of pus and a thin walled blue, necrotic glove finger shaped mass was removed The mass was thought to represent the distal half of the appendix There was a fecolith about 1 inch long free in the abscess cavity The appendix stump could not be found

The temperature abated and convalescence was gratifying She was discharged May 9

From the abscess cavity a colon bacillus a pneumococcus and a poorly growing slightly hemolytic staphylococcus were cultured

Fourteen months later she was readmitted for repair of an incisional hernia The appendix was sought for and removed It appeared intact and not abnormal Recovery was uneventful

#### Pathologic report (S-33-364)

The appendix was not remarkable in gross examination Histologically the mucosa was intact with increased numbers of eosinophiles There was abundant lymphoid tissue with some depletion of the secondary centers and replacement by reticular cells There was slight scarring of the inner circular muscular coat with perivascular lymphocytic infiltration in the serosa and proliferative endarterial changes in several mesenteric arteries

Diagnosis—Appendiceal abscess  
Measles convalescent

#### 3 D B No 170224 female, aged six years one month

This girl was admitted to the Children's Hospital April 21 1933 four days after the onset of illness characterized by fever, cough and conjunctivitis Koplik spots were recognized by the mother formerly a nurse The day before admission a measles exanthem appeared Thirty six hours before admission and just before the rash was noted she awakened at night complaining of sharp pain in the right lower quadrant This was followed by vomiting An enema was returned with fecal contents following which the child slept The day before admission abdominal pain continued The temperature was 103°

On admission the temperature was 101 the pulse rate 155 and the respiratory rate 38 She appeared acutely ill and presented a typical measles rash The abdomen was diffusely tender particularly in the right lower quadrant where there was muscle spasm and an ill defined mass

At operation the peritoneum was injected and edematous When incised the inflamed omentum presented and soapy exudate welled up from the right iliac fossa The appendix enveloped in inflamed omentum was removed Draining was instituted

Convalescence was rapid

#### Pathologic report (S33-170)

The appendix was wrapped in omentum enclosing an abscess containing 23 cc of foul smelling pus The external omental surface was deep red in color and covered in areas by fibrinopurulent exudate In the proximal portions of the appendiceal lumen there was a soft fecolith measuring 1.5 cm. in length The distal portion was distended by slightly hemorrhagic purulent exudate The mucosa was diffusely ulcerated and of dirty reddish gray appearance Serial sections from a number of blocks were studied microscopically There was an acute diffuse phlegmonous inflammation irregularly involving all coats with fairly extensive ulceration The lymphoid tissue was considerably depleted even in nonulcerated areas In the latter there were many plasma cells in the mucosa and in the lymphoid tissue and lymphatics of the submucosa Together with these there were fairly frequent large cells seemingly variants of plasma cells or of monocytes with basophilic cytoplasm large nuclei with well defined nuclear borders and irregular chromatin threads with occasional thickenings which were not at all confined to the periphery Cells of this type were not infrequently found in mitosis and occasionally were lobulated bi or trinucleated In one small submucosal lymphatic there was one cell of this type with a clustered group of about 810 nuclei similar to the giant cells described in the literature These cells were better defined in sections stained by hematoxylin-eosin than in those by eosin methylene blue or Giemsa

Diagnosis—Acute suppurative appendicitis with periappendiceal abscess  
Measles

#### 4 J McMI, male aged nine years

This boy was seen in consultation at the Framingham Union Hospital on March 4 and operated on March 5 1934 He became ill on February 12 and a typical measles rash was apparent February 16 On February 20 he complained of generalized abdominal discomfort and vomited several times The pain persisted There was diarrhea February 20 and 24 and generalized abdominal tenderness He then improved and fever which had been present, abated On March 2 the temperature became elevated the child appeared quite ill and he complained of right sided abdominal pain On March 4 the temperature was 103°, the pulse rate 120 He was flushed The tongue buccal mucous membranes and fauces were very red He coughed frequently and breath sounds were suppressed at the base of the right lung There was tenderness and muscle spasm limited to the right flank and right lateral aspect of the abdomen Maximum tenderness was obtained at McBurney's point There was tenderness and edema of the rectal wall high on the right

Operation was performed March 5 The peritoneum was red and edematous There was no free exudate but posteriorly and laterally to the cecum there was a large abscess extending into the flank and toward but not into the pelvis The pus had a feculent odor The appendix was not palpable

Following drainage of the abscess recovery was prompt Readmission for appendectomy was advised but the advice was not followed

Diagnosis—Appendiceal abscess  
Measles convalescent

#### 5 L VI male aged seven years

This boy was seen in consultation March 29 1934 and operated on in the Framingham Union Hospital on March 31

On March 19 he developed fever of 105 vomiting

experience reported the association of measles and appendicitis in three of 3,000 "young persons and children" with appendicitis. He described a girl of fifteen years who was operated on the day before the rash appeared and a fourteen year old girl who was operated on after two days of abdominal cramps and vomiting. The latter had a white blood cell count of 5,000 and, at operation, presented a gangrenous appendix with peritonitis. Four days after operation a morbilliform rash appeared. His third patient, a boy of seventeen years developed right-sided pneumonia two days after the eruption had appeared. Two days later signs of appendicitis were present but were considered to be due to the pneumonia. Two days later, six days after the exanthem, there were signs of spreading peritonitis. At operation there was generalized peritonitis of appendiceal origin. All three patients recovered, two after stormy convalescence.

Rost<sup>4</sup> believed that the association of measles and appendicitis was rare. He reported a case of a four year old boy who developed signs of appendicitis five days after the onset of measles and while the rash was evident. This patient was observed until the twelfth day of illness when an appendiceal abscess was drained. Rost made inquiries of various pediatricists and surgeons in Germany and, although he did not state the number of cases collected, concluded that the occurrence of appendicitis during the course of measles was more than a coincidence. He felt that gangrene was apt to occur rapidly and that it was safe to operate during measles.

Trepel<sup>5</sup> writing on the surgical complications of measles, cited Popper, Fischer and Rost and two cases reported by Gottstein and Kutner and by Ambuhl. She added nine cases observed between 1921 and 1930 and two more in 1931 that were thought to have pneumococcal peritonitis until autopsy revealed the peritonitis to be due to rupture of the appendix. Of her cases, five developed appendicitis during the prodromal stage, one during the eruption and five during convalescence. The clinical course in those cases occurring during the prodromal stage was the more acute and fulminating. She emphasized that to delay operation was unwise.

There were five reports dealing with the subject in 1932. Ferru, Perdoux and Michiels<sup>6</sup> described a boy of five years with fever and vomiting on May 30 and a measles rash on June 3 together with abdominal pain, vomiting and flexion of the right thigh. On June 6 there were signs of pneumonia and on June 8 of appendicitis. On June 11 an appendiceal abscess was drained and recovery followed. Herzberg<sup>7</sup> and Finkeldey<sup>8</sup> individually reported a case of appendicitis developing during the prodromal stage of measles and commented on the presence

of giant cells in the lymphoid tissue and mucosa of the appendix. Thenebe, Hirshberg and Cenci<sup>9</sup> reported six instances of appendicitis in 372 consecutive admissions for measles to the Hartford Isolation Hospital. In one patient appendectomy was performed during the prodromal stage (two days before the rash) and in three during the eruption stage (six, five and sixteen days after the onset of illness). These authors advanced the theory that lymphoid hyperplasia in the submucosa of the appendix might, through swelling, bring about ischemia with resulting necrosis and inflammation. These cases were observed during a ten-year period and the authors inclined to the belief that the association was coincidental. All the patients recovered. Davidsohn and Mora<sup>10</sup> reported four cases, two during the prodromal stage, one on the second day of eruption and one during convalescence. Giant cells were found in the mucosa and submucosa in the appendices of the two in the prodromal stage.

In 1935 Hathaway<sup>11</sup> reported a case with autopsy findings of a child of two and a half years with peritonitis secondary to a perforated suppurative appendicitis occurring in the prodromal period.

#### CASE REPORTS

##### 1 D S No 146 439, male, aged seven

This patient was admitted to the Children's Hospital on February 20 1931. On February 9 he had complained of headache. He coughed and his eyes were watery. He felt ill and had fever and photophobia. On February 14 a characteristic measles rash appeared. That day he complained of soreness and pain in the right side of the chest and abdomen. The pain was intermittent, aggravated by cough but not by deep breathing. The pain was dull and persistent.

On admission the child was acutely ill and complained of abdominal distress. He lay in bed with thighs flexed. The skin showed pigmentation from the recent measles. The abdomen was full and resistant particularly on the right. There was tenderness in the right lower quadrant extending well into the flank where there was a rounded tender mass between the twelfth rib and the crest of the ileum.

On February 22 a large abscess was drained extra peritoneally. Though obviously of appendiceal origin the appendix was not palpable within the abscess cavity.

Following operation the temperature became normal and convalescence was rapid. He was discharged March 12 and readmitted May 15 for appendectomy. He was discharged May 25. The appendix was not examined histologically.

Diagnosis—Appendiceal abscess

Measles convalescent

##### 2 E W No 147 869 female aged seven years ten months

This girl entered the Children's Hospital April 16 1931 thirteen days after the onset of illness characterized by a chill and fever. Two days later measles was recognized. Coincident with the appearance of the rash she complained of pain in the right side of the abdomen aggravated by lying on that



growth of the Bergen Logan bacillus in pure culture was obtained in eighteen hours. A normal appearing but very long, appendix was removed. The terminal ileum was inspected. It was not inflamed. There was no diverticulum. The mesenteric lymph nodes were rather prominent, but not red or succulent. One node was removed for examination. The wound was closed.

Convalescence was rapid and afebrile. He was discharged nine days after operation.

#### Pathologic report (S-36-135)

Except for mild vascular congestion the appendix grossly was not remarkable. Serial sections from a number of blocks of tissue were studied microscopically. There was an early acute inflammation chiefly involving a narrow sector of muscular and serosal coat, in only one block characterized by vascular dilatation leukostasis endothelial swelling and perivascular leukocytic infiltration. In most blocks there were well defined areas of mucosal edema and in instances submucosal vascular changes similar to those in the muscular and serosal coats but with little perivascular leukocytic infiltration. The lymph node was characterized by widened sinuses with many lymphocytes and few monocytes. There were rare polymorphonuclears.

Diagnosis—Early mild acute appendicitis  
Early mild peritonitis  
Measles convalescent.

#### DISCUSSION

Analysis of the cases reported above brings out the fact that the symptoms and signs pointing to appendicitis bear a close time relationship to the prodromal and eruption stages of measles. Thus in cases 1, 2 and 3, the appearance of the exanthem and a complaint of abdominal pain were noted on the same day. In case 7 acute appendicitis occurred on the first day of illness and three days before the rash was noted. In the remaining cases, 4, 5, 6 and 8, the onset of abdominal symptoms was four, two, four and seven days, respectively, after the eruption was noted. In two of these four the clinical histories were less reliable than in the others and it is at least possible that the onset of appendiceal inflammation coincided more closely with the rash than appears from the records.

In another patient not seen but of whom we have personal knowledge, abdominal symptoms and signs were present the day before the rash, but as Koplik spots, leucopenia and cough were noted operation was deferred. The day following hospital admission, a measles rash was present. Two days later there were signs of peritonitis and operation was performed. Pneumonia developed four days after operation and death ensued. Necropsy revealed a generalized peritonitis (*B. coli*) secondary to a perforated appendix. The appendix histologically presented acute and chronic inflammatory changes. There were no giant cells. There were occasional groups of monocytes of the type described in the case reports. No giant cells were seen in

the lymph nodes, spleen or other portions of the gastrointestinal tract.\*

There is very little known about the visceral lesions of measles. This has been due to the infrequency with which surgical and autopsy material can be obtained during the course of the disease. The character of the lesions in the sequelae, however, has been fully described (post-measles pneumonia, encephalitis). It would be fairly easy to explain the onset of appendicitis, particularly in the prodromal and early exanthematic stages if visceral lesions comparable with those of the skin or buccal mucous membrane occurred, as they would allow for the ready ingress of secondary invaders. One might also expect a higher incidence of such complications in that instance. But as yet no such visceral lesions have been described in the human being although they are said to occur in experimental animals. The presence of giant cells in lymphoid organs of which there are nine reports in the literature† although of diagnostic significance may merely indicate that there are possibly certain tissue changes (functional or immunological) which in one or another way may predispose to infection. Their presence and relationship to inflammatory processes appear to be very inconstant, however. Whereas Herzberg, Finkeldey and Davidsohn and Mora have described them in acute inflammatory appendices, von Schultze<sup>12</sup> and Fischer<sup>13</sup> have described them in the same organ in the prodromal stages of measles without any inflammatory changes. Their absence or scarcity has been explained on the basis that these large multinucleated cells rapidly degenerate and disappear, particularly in the presence of infection. Thus in Hathaway's case giant cells were found in the peribronchial, retroperitoneal and peripancratic lymph nodes but were absent in the lymphoid tissues of the gastrointestinal tract including the appendix and mesenteric nodes. Yet in one instance we could find no giant cells in a relatively normal appendix removed during the prodromal period, although serial sections of several blocks were examined. We could find only one giant cell of the type described in the literature in the one instance (case 3) where the appendix was removed one day after the appearance of the rash and one in the appendix removed three days before the appearance of the exanthem (case 7).

It was thought, however, that a careful comparison of the sections obtained from the cases with acute appendicitis during the course of measles with some 200 from children where

\*Another patient not seen but described to me by a health official in 1934 presented measles and appendicitis and died. The relation of appendicitis to the rash is not known.

†In addition to those mentioned here in connection with the appendix there have been three reports by Alagna,<sup>14</sup> Warthin<sup>15</sup> and Finkeldey<sup>16</sup> in which giant cells have been found in the tonsils during measles.

‡This case not referred to elsewhere.

and diarrhea. Vomiting was limited to the first day of illness but diarrhea with mucus but no blood, persisted as did the fever. On March 21 a measles rash was recognized. On March 24 he complained of abdominal pain. During the next five days there was recurrent abdominal distention, partially relieved by the use of a rectal tube. Abdominal pain and fever varying between 99 and 101.

When examined March 29, he appeared acutely but not critically ill. He complained bitterly of paroxysmal pain across the lower abdomen. The temperature was 102, the pulse rate 138. The tongue was dry and coated. There was a well defined suprapubic mass about 4 inches in diameter extending slightly more to the left than to the right. There was muscle spasm adjacent to the mass. A large, very tender mass was palpable through the rectum.

At operation, March 31 a tremendous abscess containing 300 or 400 cc of foul pus was drained. The abscess was confined to the left suprapubic region and pelvis. The appendix was not found but a bit of necrotic material resembling the appendix was discharged.

Convalescence was protracted and a small sinus drained intermittently for six months. Appendectomy was refused.

Diagnosis—Appendiceal abscess  
Measles, convalescent

6 R. B. No 174959, female aged five years six months

This child was admitted to the Children's Hospital May 13 1934, one week after the onset of illness characterized by fever, cough and conjunctivitis. On May 10 measles exanthem was present and she vomited three times each time after a paroxysm of coughing. She did not complain of pain and slept well. The day before admission she seemed quite well, coughed a little, but slept most of the time. In the midafternoon she complained of midabdominal soreness, was nauseated and vomited once. She slept the early part of the night but awakened at 2 00 a m. complaining of right sided abdominal pain. She was feverish. She was seen in consultation the following afternoon and sent to the hospital for operation.

The temperature was 101, the pulse 110, the respirations 50. The child appeared acutely ill and coughed frequently. There was a fading measles exanthem. Diffuse crackling râles were present throughout both lungs, more marked on the right where an area of dullness was present below the scapula. There was marked tenderness and muscle spasm throughout the right side of the abdomen, more particularly in the lower quadrant. There was tenderness on the right during rectal examination.

At operation on May 13 the peritoneum did not appear inflamed but when incised the omentum presented overlying the cecum. Behind the cecum a lemon sized abscess cavity containing foul pus and a swollen necrotic appendix perforated near the base was encountered. A fecolith was extending through the perforation. The appendix was removed and drainage instituted.

Convalescence was gratifying and the child was discharged thirteen days after operation.

Pathologic report (S 34 195)

Grossly the appendix was greatly swollen with a plaque of fibrinous exudate over one area of the reddened serosa. There were two fecoliths within the lumen of the appendix, one at the very distal end. The mucosa was edematous and deeply redened. Serial sections were cut and stained from a number of blocks. In all there was an acute dif-

fuse phlegmonous and suppurative inflammation involving all coats, with irregular and extensive mucosal ulceration, lymphoid depletion and very little reticular cell proliferation. In some of the sections, especially those from nonulcerated mucosal portions, there were frequent plasma cells in an edematous, loose and vascular mucosal and submucosal stroma with fairly frequent but fewer cells of the type described in case 3.

Diagnosis—Acute suppurative appendicitis with perforation and abscess formation  
Bronchopneumonia  
Measles, convalescent

7 R. P. No 199921 female aged eight years nine months

This child vomited at breakfast March 14 1936. During the morning she vomited several more times. She did not complain of pain. Her temperature was normal. At 1 30 p m she was examined by her physician who found a mouth temperature of 99.9, slightly inflamed throat and slight inflammation of one ear drum. She vomited several times in the early afternoon, then fell asleep and awakened at 4 30 complaining of abdominal pain. At 6 30 p m the temperature was 102 and there was tenderness and muscle spasm in the right lower quadrant of the abdomen. Rectal examination was painful.

She was admitted to the Children's Hospital and operation was performed at 9 00 p m. A swollen, tense, deeply red appendix was removed. The lumen contained pus under tension.

On the second day after operation the temperature rose to 101.8 and there was infrequent cough. She complained of headache and photophobia. She slept well. On the third day Koplik spots and a faint rash were noted. On the fourth and fifth days a well marked measles exanthem was present. On the sixth day the rash had faded, the conjunctivitis had disappeared and the temperature was 100. The wound healed well. She was discharged on the eleventh day after operation.

Pathologic report (S-36 104)

There was mild to moderate acute diffuse inflammation involving all coats with mucosal ulceration. There was one giant cell in the mucosa of only one section in serials from several blocks.

Diagnosis—Appendicitis acute  
Measles

8 H. S. No 143597 male aged six years

This boy became ill April 1, 1936 and developed typical measles with rash on April 4. He was not very ill. On April 5 and 6 he was considered essentially well. At 1 30 a m April 7 he awakened from sleep with severe abdominal pain. He vomited three times. Between 1 30 a m and 9 30 a m he had frequent attacks of severe paroxysmal abdominal pain. He slept from 9 30 to 10 30 a m, when he had another colicky attack of pain. There was further pain at 11 30 a m. Examination revealed the patient to be acutely but not critically ill and in no apparent distress. He stated that he had pain and pointed to McBurney's area. His temperature was 98.8, the pulse rate 64. His tongue was dry and coated. There was pigmentation as a result of the measles rash. The abdominal examination was entirely negative. On rectal examination however there was a point of exquisite tenderness very high on the right. The white blood count was 11 300 and the differential count normal. The urine was negative on examination.

He was admitted to the Children's Hospital on April 7 and operation was performed. When the peritoneum was incised slightly cloudy, odorless fluid welled up. This was cultured. An abundant

# A SIMPLE METHOD OF OXYGEN ANALYSIS FOR USE IN OXYGEN TENT THERAPY\*

BY JOSEPH E. F. RISEMAN, M.D.† AND GERSON LESNICK, B.S.‡

THE patient within an oxygen tent may fail to receive an adequate supply of oxygen unless gas analyses are performed at frequent intervals. Barach<sup>1</sup> has recently called attention to this danger and experience at the Beth Israel Hospital is in complete accord with his views. Unfortunately the available methods of oxygen analysis are not adapted for use by the nurse or attendant in charge of the patient. While it is true that the methods of analysis "can be learned in one-half hour by almost any attentive individual",<sup>2</sup> from one to three persons must be instructed each time a tent is put into operation and few institutions are able to arrange for the necessary teaching staff.

The apparatus described below was devised to satisfy the need for an instrument which would be accurate, inexpensive and simple enough to operate so that it could be used efficiently without any previous instruction or experience. The accuracy of the method is shown in table 1. It is evident that the method is

## DESCRIPTION OF APPARATUS

The assembled apparatus is shown in figure 1. In principle the method consists of absorbing the oxygen from a known volume of gas and determining the residual volume. The oxygen is absorbed by means of copper gauze and an ammoniacal solution. Simplicity of operation is

TABLE 1 THE ACCURACY OF THE METHOD			
Gas Sample Number	Per Cent Oxygen Content Method of * Van Slyke and Sendroy <sup>4</sup>	Oxygen Content Method Described in Text Instru- ment A†	Instru- ment B‡
1‡	20.70	21.0	20.5
2	31.51	31.0	32.0
3	43.62	43.5	43.0
4	55.04	55.5	55.0
5	70.69	71.0	70.0
6	78.88	80.0	80.5
7	88.59	88.0	88.5
8§	99.49	99.0	100.0

\*Average of two analyses differing by 0.5 per cent or less  
†Average of two analyses differing by 2 per cent or less  
‡Room air  
§Sample direct from oxygen tank

sufficiently accurate for clinical use. The cost of the materials used in making six analyzers at the Beth Israel Hospital was \$22.54.† The apparatus can be built by anyone handy with tools. The simplicity of operation is attested by the fact that nurses and laymen without supervision and with no previous experience with oxygen analysis have encountered no difficulty in using the apparatus the first time.

\*From the Medical Research Department of the Beth Israel Hospital and the Department of Medicine of Harvard Medical School.  
†These analyzers were made with brass stopcocks. A stainless steel valve is less likely to be corroded by the solutions used but is more expensive.  
‡Riseman, Joseph E. F.—Assistant in Medicine, Harvard University Medical School 1931. Lesnick, Gerson. For records and addresses of authors see "This Week's Issue" page 9.

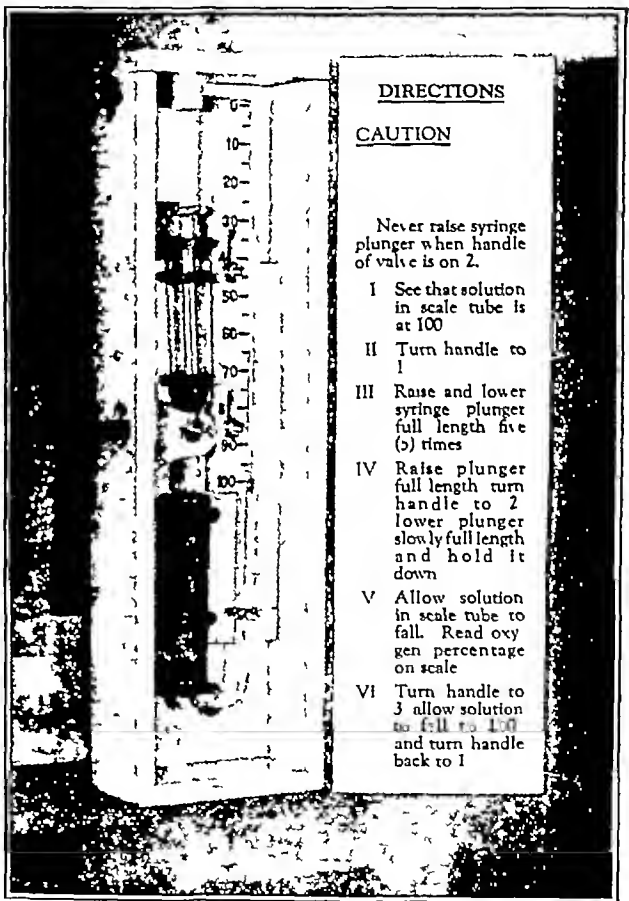


FIGURE 1 The apparatus assembled and mounted on the tent

attained by three devices which result in automatic measuring of the volumes of the sample and the residual gas and in simplified operation of a three way valve.

A stop built into the box (figs 1 and 2) which contains the analyzing apparatus automatically limits the withdrawal of the plunger of a glass syringe (figs 1 and 3) so that the sample of gas measures exactly 10 cc. This gas sample is passed into an absorption chamber. The fluid displaced rises in a calibrated side tube, as the oxygen is absorbed, this column

there was no such relationship, might reveal some differences to help explain the fairly strict temporal association of the two. Although it was realized that similar factors to those ordinarily underlying appendicitis (fecoliths, pharyngitis and tonsillitis) were present at least two significant differences were found. In general there was less lymphoid tissue with practically no secondary centers or germinal follicles in the group with measles. In the control group, the germinal follicles were generally large and prominent. There appeared to be more plasma cells, particularly in the submucosa, in those with measles and in two (first day after exanthem and less so on the third day after exanthem) there were numbers of larger cells in the mucosa, lymphoid tissue and submucosa with basophilic cytoplasm and large prominent nuclei which were often oval or spherical and, at times, lobated and distorted, occasionally with two and rarely with three nuclei. Such cells were infrequently observed in the mucosa of the controls and rarely in the submucosa and lymphoid tissue. The distribution and character of the inflammatory exudate did not differ in the two groups. No specific vascular lesions were found. The proliferation of reticular cells was equally prominent or less conspicuous in the two groups.

It is of course realized that the histologic material is too meager to warrant broad conclusions. Nevertheless there seems to be some anatomic variation in the two groups which lends support to the clinical impression that the association of measles and appendicitis is more than merely coincidental.

Five patients seen and operated on thirteen days, thirteen days, twenty-one days, twelve days and seven days, respectively, after the onset of illness had well-localized appendiceal abscesses. One operated on the day following the rash and the fourth day of illness presented an acutely inflamed appendix, wrapped in omentum with localized peritonitis. All recovered and, in all, the symptoms and signs of appendicitis were masked by the stigmata of measles. These two facts suggest a less virulent infection than is often the case in childhood appendicitis.

Adding the eight personal cases, the additional one known from personal communication and those reported in the literature, there are forty cases. In fifteen, appendicitis developed during the prodromal stage, in twelve during

the eruptive stage and in thirteen during the immediate convalescent period. Thirty-nine of the forty patients were children or adolescents. There were only two deaths.

#### CONCLUSIONS

To the thirty-one instances of measles and appendicitis reported in the literature nine are added. From this experience and the review of the literature, the conclusion is reached that there is an intimate relationship between the two diseases.

Regardless of whether measles is an etiologic factor in the development of appendicitis, it is established that the two may coexist.

In the presence of measles a thorough abdominal examination is indicated together with careful appraisal of the symptoms of abdominal pain and vomiting which are frequently present.

If the signs of appendicitis are demonstrated, operation is indicated despite the presence of measles.

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absorption chamber The corresponding water level in the tube is marked 100 The valve is turned to 1 the plunger raised full length, the valve turned to 2, and the plunger slowly depressed full length The height to which the water column rises in the tube is marked 0 The distance between the 0 mark and 100 mark is

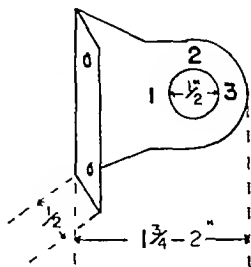


FIGURE 4 Numbered plate for valve This is fastened to the side of the box (see figure 1) so that the handle of a syringe fits through the central hole The position of the valve is indicated by the numbers

divided into 10 equal parts and numbered in the proper order from 10 to 90 The space between each two markings is further divided to represent the 5 per cent levels The water is removed by inverting the apparatus and turning the valve to position 3

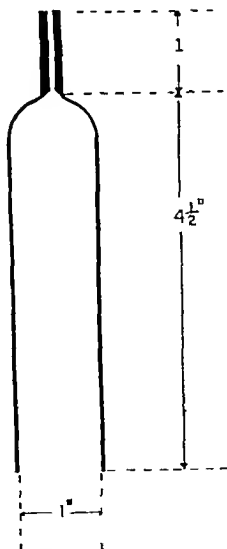


FIGURE 5 Absorption chamber for high concentrations of oxygen (over 85 per cent)

The absorption chamber may now be filled with the absorbing fluid and the entrapped air removed in a fashion similar to that described above Set the movable scale with the 100 mark at the level of the fluid in the glass tube, and the apparatus is ready for use The efficacy of the apparatus is tested by analyzing room air which should yield approximately 21 per cent oxygen

#### THE ABSORBING FLUID AND CARE OF THE APPARATUS

The absorbing fluid must yield accurate and speedy analyses and should be capable of absorbing a large volume of oxygen before requiring renewal

Approximately 100 cc of the most satisfactory absorbing fluid for routine use in this instrument is prepared in the following manner Dissolve 65 grams of ammonium nitrate in 45 cc of water, add 15 cc concentrated ammonium hydroxide The apparatus when filled with this solution (approximately 30 cc) will absorb about 400 cc of oxygen before a sediment forms which may clog the pores of the

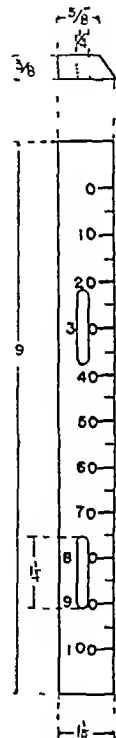


FIGURE 6 Adjustable scale to indicate calibration of glass tube When mounted the edge of the ruler overlaps the calibrated tube (see figure 1)

copper gauze and coat the calibrated tube If facilities for glass blowing are available a reservoir may be inserted in the long arm of the calibrated tube below the 100 mark This will permit the apparatus to contain approximately 100 cc of absorbing solution The amount of oxygen which can be absorbed before it is necessary to clean the apparatus will be correspondingly increased For concentrations of oxygen greater than 90 per cent<sup>2</sup> the solution described by Badger<sup>3</sup> is somewhat more satisfactory This is prepared by mixing equal parts of water and concentrated ammonium hydroxide and saturating this mixture with ammonium chloride This solution absorbs oxygen more rapidly than the ammonium nitrate mixture and the instrument will absorb about 650 cc of oxygen before the

of fluids falls, the volume of the residual gas, and therefore the percentage of oxygen, is indicated automatically by the height of the column.

A three-way valve allows one to direct the flow of gas in the desired direction (figs 1 and 3). The positions of the valve handle are numbered (figs 1 and 4) so that the technician sim-

removal of the syringe plunger for cleaning or lubrication (fig 2).

The assembled apparatus is attached permanently to the oxygen tent (fig 1), a separate analyzer being used for each tent. The side arm of the valve is connected to the hose carrying air from the tent by rubber tubing no larger than 1/8" in diameter and 12" in length.

Directions for use have been found to be self-explanatory. They are mounted permanently on the door of the box and covered with a piece of washed x-ray film (See figure 1).

#### CALIBRATION OF THE INSTRUMENT

The scale is marked on a wooden rod which partially covers the glass tube and is secured

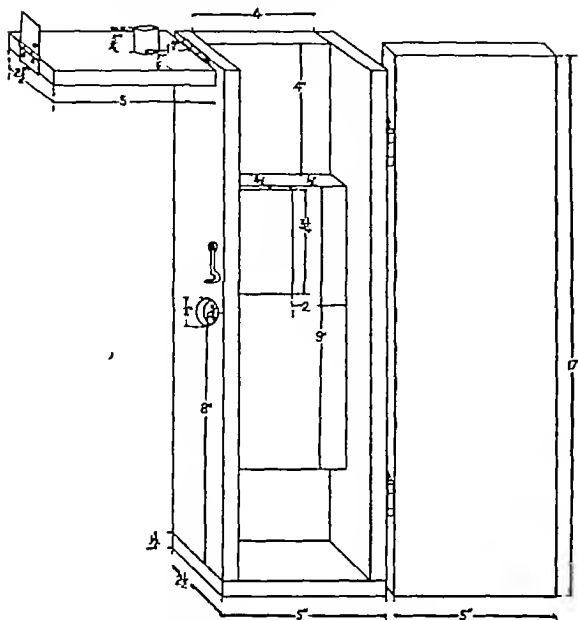


FIGURE 2. Container to protect glass parts and ensure automatic measuring of sample to be analyzed. To mount the analyzer first fasten the glass syringe and stopcock (see figure 1) so that when the top of the plunger rests against the dowel stop the syringe will hold exactly 10 cc.

ply moves the handle in a clockwise direction from position 1 to position 2 and to position 3. Position 1 connects the measuring syringe with the tent, position 2 allows the gas sample to be passed into the absorption chamber, and position 3 resets the apparatus for the next analysis. Thus the nurse has no sample and residual volumes to measure, no fluid levels to adjust and no uncertainty as to which way the valve has been turned.

For high concentrations of oxygen (90 per cent-100 per cent) such as are used in the type of tent described by Fine and his co-workers,<sup>2</sup> an absorption chamber with a rounded or conical top (fig 5) is necessary, but for ordinary clinical use (concentrations up to 85 per cent) the barrel of a large tipped 30 cc syringe is equally satisfactory, readily available, and inexpensive since it utilizes material frequently discarded when the plunger becomes broken.

Breakage is minimized by protecting the syringe tip with DeKhotinsky cement and by mounting the analyzer in a sturdy wooden box (figs 1, 2, 3). The top of this box is fastened by hinges so arranged that release of a thumbscrew allows it to be thrown back to permit the

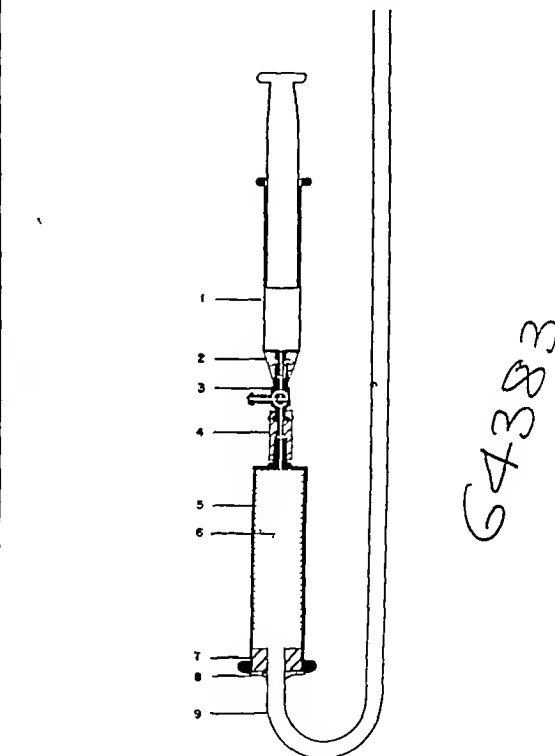


FIGURE 3. The analyzer.  
1 10 cc glass syringe  
2 DeKhotinsky cement  
3 Three way metal valve (preferably of stainless steel) with luer tip luer adaptor and side arm for rubber tubing  
4 Rubber tubing about 1 inch long with 1/8 inch bore and 1/4 inch wall  
5 The absorption chamber. A large tipped 30 cc syringe barrel (see figure 5)  
6 Tightly rolled copper screening 30 to 40 mesh per inch approximately 3 1/4 inches wide and 30 inches long  
7 One hole rubber stopper  
8 DeKhotinsky cement  
9 Glass tubing inside diameter 8 to 9 mm. The long arm measures approximately 14 to 15 inches the short arm 1 1/2 inches the distance between the arms 1 3/4 inches

by thumbscrews permitting adjustment of the 100 mark (figs 1 and 6).

With the valve handle at number 3, approximately 30 cc of water is admitted through the glass tube. Entrapped air is expelled by going through the same maneuvers as for gas analysis. More water is added and the entrapped air again expelled until the fluid just fills the

absorption chamber The corresponding water level in the tube is marked 100 The valve is turned to 1 the plunger raised full length, the valve turned to 2 and the plunger slowly depressed full length The height to which the water column rises in the tube is marked 0 The distance between the 0 mark and 100 mark is

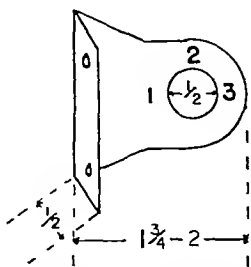


FIGURE 4 Numbered plate for valve This is fastened to the side of the box (see figure 1) so that the handle of the syringe fits through the central hole The position of the valve is indicated by the numbers

divided into 10 equal parts and numbered in the proper order from 10 to 90 The space between each two markings is further divided to represent the 5 per cent levels The water is removed by inverting the apparatus and turning the valve to position 3

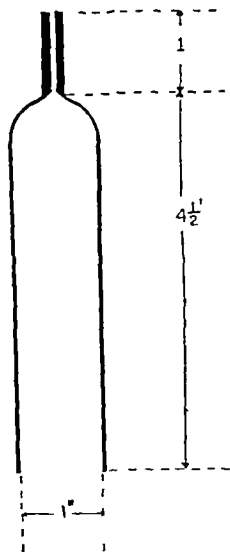


FIGURE 5 Absorption chamber for high concentrations of oxygen (over 55 per cent)

The absorption chamber may now be filled with the absorbing fluid and the entrapped air removed in a fashion similar to that described above Set the movable scale with the 100 mark at the level of the fluid in the glass tube and the apparatus is ready for use The efficacy of the apparatus is tested by analyzing room air which should yield approximately 21 per cent oxygen

#### THE ABSORBING FLUID AND CARE OF THE APPARATUS

The absorbing fluid must yield accurate and speedy analyses and should be capable of absorbing a large volume of oxygen before requiring renewal

Approximately 100 cc of the most satisfactory absorbing fluid for routine use in this instrument is prepared in the following manner Dissolve 65 grams of ammonium nitrate in 45 cc of water, add 15 cc concentrated ammonium hydroxide The apparatus when filled with this solution (approximately 30 cc) will absorb about 400 cc of oxygen before a sediment forms which may clog the pores of the

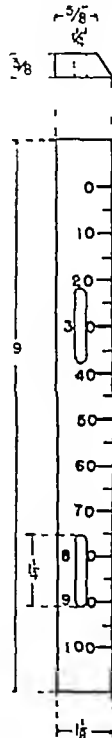


FIGURE 6 Adjustable scale to indicate calibration of glass tube When mounted the edge of the ruler overlaps the calibrated tube (see figure 1)

copper gauze and coat the calibrated tube If facilities for glass blowing are available a reservoir may be inserted in the long arm of the calibrated tube below the 100 mark This will permit the apparatus to contain approximately 100 cc of absorbing solution The amount of oxygen which can be absorbed before it is necessary to clean the apparatus will be correspondingly increased For concentrations of oxygen greater than 90 per cent<sup>2</sup> the solution described by Badger<sup>3</sup> is somewhat more satisfactory This is prepared by mixing equal parts of water and concentrated ammonium hydroxide and saturating this mixture with ammonium chloride This solution absorbs oxygen more rapidly than the ammonium nitrate mixture and the instrument will absorb about 650 cc of oxygen before the



precipitate forms but this strong ammonia solution fails to yield accurate analyses with low oxygen concentrations and tends to form a more troublesome precipitate on the copper gauze.

Soon after the precipitate becomes visible on the copper screening or in the calibrated tube it should be removed in the following manner:

1 Raise the top of the container. Connect the calibrated tube to an empty bottle by rubber tubing and the side arm of the valve to a bottle of unused absorbing solution (a 20 per cent solution of ammonia is less expensive but works more slowly).

2 Direct the unused absorbing solution (valve on 1, raise plunger, valve on 2 lower plunger, and repeat) into the absorption chamber until the old blue fluid has been replaced.

3 Remove entrapped air by turning the valve to 2 and raising the syringe plunger.

4 Allow the solution to remain in the absorption chamber until all visible sediment is dissolved (about 5 minutes).

5 Add fresh solution until the blue color disappears.

6 Disconnect the rubber tubing from the calibrated tube. With the valve on 2 raise the plunger and empty the calibrated tube to the 100 mark.

7 Clean and dry the syringe and lubricate the barrel with a small amount of liquid petroleum.

8 Close and fasten the top. The instrument is again ready for use.

#### SUMMARY

An instrument for determining the concentration of oxygen within an oxygen tent is described. The directions for use are simple enough so that the apparatus can be used efficiently by a nurse or attendant without previous instruction or experience. The method yields results which are accurate within 2 per cent. Instructions and working diagrams are given so that the instrument can be built by anyone handy with tools. The retail cost of the necessary parts is approximately four dollars.

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## THE PLURALITY OF STREPTOCOCCAL TOXINS\*

BY SANFORD B. HOOKER, M.D.†

MY first intention to discuss only the differences among the erythrogenic or primarily rash-producing scarlatinal toxins has been modified. These toxins are not among the most destructive weapons of streptococci and the particular one that I have studied is of minor practical importance. So it seems more useful, on this occasion, to include some discussion of the whole known arsenal of this disabling and death-dealing tribe of micro-organisms. During the fifty years since streptococci were first clearly established as a genus we have learned much about their ubiquity, their hundreds of varieties, their changeable and diverse degrees of virulence, and the long list of diseases that they cause or complicate. We have come to appreciate very keenly the host of arduous and perplexing problems that confront the student of streptococci but our growing knowledge has barely now attained the stage of adolescence. There is still a long road to travel before we shall be able to control these micro-organisms but it may be confidently expected that we shall travel with accelerated speed because of improved technology, better training of investigators, and the development of more penetrating concepts. Among the lat-

ter there are none more profoundly significant than the one that recognizes the urgent need for a precise determination of those bacterial antigenic components or products that are of fundamental importance to virulence and to immunity.

Of the ten thousand papers dealing with the streptococcus many are devoted to such antigenic analyses. Scores of distinctly qualitative differences are demonstrable among some of the antigens present in any considerable collection of streptococci. A single strain may contain or elaborate several antigenic components whose activities are separable by appropriate methods. The already difficult analysis of such a mosaic structure is further complicated by the recently discovered phenomenon of bacterial dissociation whereby important antigenic constituents are often lost and less often regained or even changed. The structure thus becomes kaleidoscopic. There are so many impediments and well-hidden pitfalls that the most wary investigator is sure to be temporarily frustrated or entrapped, at least once, and more probably, many times.

Most of these analyses have been applied to those specific agglutinative characteristics that permit an allocation of some strains into "serologic" groups. As one who long indulged hopefully in this kind of botanizing among the

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cocci, the writer concluded that, in this group, no classification of service to medicine can be achieved by this method. There is such a bewildering variety of individualistic strains that among six hundred odd cross-tests there were less than three per cent of strong cross agglutinations and no identical strains were found. The same extraordinary antigenic heterogeneity doubtlessly exists among the similarly saprophytic *alpha prime* and *gamma* types.

The (*beta*) hemolytic streptococci can be thus grouped to some extent, but, even in this more virulent species, antigenic diversity is pronounced. There is only a slight tendency toward an association of agglutinative groups with clinical entities.

There are reasons for thinking that our attention has been unwisely and too exclusively focussed upon minute differences in agglutinative specificity. The complexity of the maze into which we have thus been led, and the enormous obstacles to specific antibacterial therapy thereby interposed should, from an economic standpoint alone, encourage us to seek other, perhaps less tortuous, lines of approach to the ultimate therapeutic goal. With these considerations in mind we turn to a brief discussion of the types of streptococcal substances which may all or in various combinations be attributes of a single strain. They have been studied in greatest detail in connection with the more virulent hemolytic varieties. The term 'toxin' is used in its broadest (clinical) sense.

#### HEMOTOXIN

This hemolytic substance, useful in the classification of streptococci is very unstable. It is sensitive to moderate heat, is quickly oxidized to an inactive form, and is readily adsorbed by filters. In cultures, the production of hemotoxin begins early, reaches its height in eight to twelve hours, then rapidly declines. These characteristics obviously impede investigations of its chemical and immunologic nature.

Hemotoxin lyses a variety of bloods, including human. Intravenous injections of lytic filtrates into rabbits induce rapidly fatal toxemia or progressive anemia. These results do not follow the injection of filtrates previously heated only to 37 degrees C for twelve hours, therefore they are more probably due to the highly labile hemotoxin than to other poisonous components of the filtrate from a young culture.

Hemotoxin is antigenic, it stimulates the production of an antilysin which neutralizes the toxin's hemolytic property. Following tonsillitis, scarlet fever and other infections with hemolytic streptococci the patients' sera contain increased quantities of antistreptolysin. It ap-

pears that hemotoxin is antigenically species specific rather than strain-specific. This fact will greatly simplify and cheapen the production of antihemotoxin should such an antibody prove to be medically useful.

The significance of streptococcal hemotoxin is difficult to appraise. There is some correlation between a strain's virulence and its ability to secrete a highly potent lysin although an avirulent strain may produce enough to cause a clear circumcolonial zone in a blood-agar plate. Many analogies make it likely that this toxin is able to damage tissue cells other than erythrocytes. We must then, not lose sight of the possibility that this difficultly investigable thermolabile toxin may be an important adjunct to progenicity and invasiveness—the most dangerous offensive properties of hemolytic streptococci.

#### LEUKOCIDIN

It is held by some that the hemolytic and leukocidal effects of streptococcal filtrates should be ascribed to a single substance. This position hardly seems tenable in view of the following differentiating characteristics. Leukocidin is produced during the early growth of streptococcal cultures but it persists much longer than hemotoxin is distinctly more thermostable, more readily filtrable, and requires different optimal conditions for its production. Leukocytes specifically adsorb it and hemotoxin is left in a filtrate that originally exhibited a dual activity. Its effect upon leukocytes differs from that produced by the organic acids formed in cultures of streptococci.

Leukocidin is definitely correlated with virulence. It is antiphagocytic and in increasing concentrations kills and disintegrates leukocytes. Macrophages are more resistant than polymorphonuclears. The potency of leukocidin may most neatly be measured by observing its effect upon the respiratory activity of leukocytes. The ingenious "bioscopic" method of Neisser and Wechsberg depends upon the ability of living leukocytes to metabolize oxygen and thus reduce methylene blue, in the absence of air, to a colorless compound. Leukocidin inhibits or abolishes this activity.

The antigenic properties of leukocidin have received practically no study. Ordinary anti-streptococcal sera do not neutralize its activity but this may well be due to its inadequate representation in the material injected into the animals furnishing the sera. Thus is emphasized the imperative need in producing effective immune sera for inocula that contain a full complement of the antigens elaborated by living, fully virulent bacteria. The development of the agar-focus or blood clot method of immunization is a progressive step in this direction, but the production of adequately super-

immune serum may require supplemental injection of some antigens in more concentrated form and larger dose than can be supplied by small artificial foci of living organisms. There is one meager report that immune serum produced by injection of leukocidal filtrate does possess a neutralizing property, and that leukocidin is a species specific and not a type-specific substance. From the economic and investigational standpoints the immense importance of such antigenic nonheterogeneity merits repeated emphasis.

Despite our very limited knowledge of this substance, it does not seem overbold to predict that leukocidin is destined to occupy a position of high eminence among the factors that contribute to streptococcal virulence. Anv agent so offensively antagonistic to phagocytic cells—the indispensable bulwark of antibacterial immunity—deserves most thorough study. Our partial successes in controlling the streptococcoses are so restricted as no longer to permit a continuance of our neglectful attitude toward this pathogenic agent which so compellingly demands intensive investigation.

#### "EXOTOXINS"

The erythrogenic substances in filtrates of some hemolytic streptococci are responsible for the scarlatinal rash and the Dick reaction. They possess the one fundamental characteristic of true toxins, i.e., they are antigenic and evoke the production of an antitoxin which neutralizes according to the rule of multiple proportions. The existence of a streptococcal toxin had long been affirmed but our knowledge of its nature was broadened by the Dicks' use of the susceptible human skin as a reagent which permits some quantitative measurement both of toxin and its antitoxin.

The theory that the scarlatinal exanthem may be an allergic rather than a toxic manifestation has little to commend it.

There are wide quantitative differences in the potency of toxins derived from different strains, those of scarlatinal origin are usually the most powerful. This toxin is remarkably resistant to heat and the deteriorative effect of storage. These properties facilitate chemical investigation of its nature although accurate quantitation is hampered by the lack of a readily determinable and precise end-point.

There are distinct qualitative differences among some of the erythrotoxins produced by separate strains of hemolytic streptococci of erysipelatosus puerperal, and scarlatinal or other origin. These differences, however, may be just as distinct among separate strains from scarlet fever alone, and can even be clearly demonstrated in the filtrate of a "single-celled", pure line, polytoxicogenic strain. Our own study

of this problem has indicated that the most important toxin, which we call "A" for convenience, is produced by the large majority of scarlatinal strains and elicits much the highest rate of positive cutaneous reactions. Toxin "B," first discovered two or three years after it had been patented, is unequivocally distinguishable by a number of immunologic and chemical criteria, is produced by a considerable proportion of strains but only a small number of people react to it. A given strain may produce either, both, or neither of these toxins. Trask and Blake have reported cases in which antitoxin was ineffective and from which were isolated strains whose toxin was not neutralized by an immune serum containing both anti-"A" and anti-"B." The difficulty of finding suitably reactive test subjects has hampered the characterization of these toxins, with the exception of "A."

These additional toxins are probably of minor practical significance in the control of scarlet fever but their recognition is important to an understanding of the mechanism of the disease, and in explanation of many apparent theoretical discrepancies which have been recorded. With "B"-toxin we have induced fever, rash, desquamation, eosinophilia, and conversion of the cutaneous reaction from positive to negative in an A+B+ reactor, the cutaneous response to "A" remained unchanged. Titrations of the "A"- and "B"-content of 414 filtrates from scarlatinal strains and comparison of toxigenic types with the cutaneous reactivity of patients tested early and during convalescence led us to conclude that the "B" toxin is actively concerned in pathogenesis of scarlet fever in less than 10 per cent of the cases in this locality. Also with the co-operation of the Staff of the Haynes Memorial, we found, in 149 cases, no correlation between the incidence or kind of complication and the toxigenic potency of the patient's "B"-producing strain. The only arthritic complication developed in a patient whose strain was a very feeble "A" but potent "B" producer. Coburn has reported an institutional epidemic of rheumatic fever apparently caused by a similar strain but it cannot yet be said that "B"-toxin has a predilection for any special tissue.

The minor practical importance of "B"-toxin is further lessened by the fact that antitoxin for "B" is plentiful in most immune sera. This multivalency is sometimes fortuitously due to immunization with several strains, one or more of which would be likely to possess the rather common property of producing "B", or to the purposeful selection of a single strain, such as "N Y 5," which produces at least both "A" and "B." It is obvious that for active immunization of either man or animals a toxic

filtrate of broad antigenic scope should be chosen

In attempting to weigh the importance of streptococcal exotoxin one should remember that our knowledge of it is of but a few years' growth. Its discovery has broadened our comprehension of the pathogenic mechanism but has by no means solved the problem of controlling streptococcal infection. Exotoxin is not an especially malignant weapon of the streptococcus and rarely exerts a dominant influence in fatal infections. That an antitoxic immunity however is of some importance in aiding recovery from infection is indicated by at least three lines of evidence. (a) The large majority of those who have used antitoxin early in the treatment of scarlet fever agree that the incidence of septic complications is lessened. (b) individuals actively immunized with toxin often contract scarlatinal tonsillitis but further septic complications appear to develop less frequently than among those who lack antitoxin and contract typical scarlet fever with exanthem. (c) rabbits injected with sublethal doses of cocci die if a sublethal amount of toxin is also injected, and rabbits injected with virulent toxigenic streptococci live much longer if they are treated with a purely antitoxic serum—one devoid of demonstrable antibacterial factors. Thus a defensive mechanism relieved of the burden of combating intoxication is the better able to cope with the more strictly infections—pyogenic and invasive—forces.

#### "ENDOTOXIN"

The endotoxins are assumed to exist preformed in the bacterial cell and be liberated upon its disintegration. Some have thought that this kind of toxicity is due to poisonous protein cleavage products resulting from the action of the host's cellular and circulating enzymes upon the bacterial cell. The term endotoxin only cloaks our ignorance. In a recent book on streptococci the use of this unprecise and uninformative word in a special sense connoting virulence and specific tropismogenesis does not promote clarity of understanding. It is much more probable that leukocidin, fibrinolysin and the haptens to be mentioned are the factors most important to virulence and antibacterial immunity. Progress will be delayed if we cannot characterize these factors with more particularity than the term "endotoxin" can ever permit.

#### POLYSACCHARIDES

Since the pioneer work of Zinsser on "residue antigens" it has been revealed that these "soluble specific substances" are complex carbohydrates which belong to the class of haptens—separable components of many antigenic

materials including bacteria which condition specific reactivity but lack a truly antigenic power or possess it in a restricted sense. The streptococcal polysaccharides resemble those of the pneumococci in such features as stability and association with the capsular or ectoplasmic substance of the bacterial cell. They permit a serological separation of hemolytic streptococci into groups rather than types and the group "A" of Lancefield comprises the vast majority of those strains that are of the greatest pathologic importance in man. The further significance of streptococcal polysaccharides is doubtful. They have been shown to be abundantly present in nonvirulent (although potentially toxigenic) strains but these were *not* effective antibacterial immunizing agents.

#### TYPE-SPECIFIC PROTEIN

This substance, extractable by dilute hydrochloric acid seems to be a component that allows the separation of streptococci into antigenic subgroups or determines the behavior of individualistic strains in agglutination, precipitation and in other serologic reactions. Although of proteinic nature curiously enough it behaves as a hapten i.e. it has not yet proved capable in the pure state, of stimulating the formation of antibodies. There is a suggestion that it is of more importance to antibacterial immunity than to virulence as indicated by the observation that a strain of *attenuated* virulence may contain its full complement of this protein and be a good immunizing agent, an avirulent strain deficient in this protein did not evoke protective antibody. Inasmuch as a given specific protein is shared by relatively few strains the disadvantage to practical serum therapy is at once apparent.

Some unpublished observations by Stuart Mudd an able recent recruit to the active students of streptococci relate to the discovery of still another specific highly unstable hapten probably of proteinic nature which is importantly involved in phagocytosis. Further disclosures of the relation of this substance to virulence and immunity will be awaited with interest.

It may not be out of place here to mention the speculative idea that "toxins" in the nascent state may have a special significance.

#### "NUCLEOPROTEIN"

This material, probably a conglomerate is antigenic but possesses little differential specificity. An immune serum prepared with nucleoprotein from a hemolytic streptococcus reacts with nucleoproteins from *S. viridans*, pneumococci, staphylococci and probably other microorganisms. It is not yet demonstrably significant in immunity.

## FIBRINOLYSIS

About three years ago Tillett and Garner reported that some human strains of hemolytic streptococci produce an agent capable of dissolving clotted human (but not rabbit's) plasma, sera from patients recently recovered from streptococcal infections were able to neutralize this lytic effect upon fibrin. There have since appeared a number of brief papers dealing with fibrinolysin, fortunately, it is rather more species- or group-specific than type-specific, its importance as a factor which, by preventing the accumulation of fibrin, effectively antagonizes the protective localizing effect of inflammation can be strongly suspected. Antifibrinolysin should prove to be a notable anti-invasive agent of resistance, perhaps most critically important in the very first stage of infection.

## MISCELLANEOUS AGENTS

"Agglessin", "vinulin", "subhemagglutinin", "endotheliotoxin", and "myotoxin"—

products of the christening urge—are probably but other names for the several substances we have discussed.

Streptococci also produce a variety of enzymes which are indirectly associated with virulence only because they are more or less essential to bacterial metabolism and life, their connection with immunity is unknown.

The foregoing discussion is not intended to be a rehearsal of the past achievements of immunologic enterprise, it is more an attempt to point out the wide gaps in our knowledge, to draw attention to some neglected phases of the problem, to suggest that others have possibly been overemphasized, to indicate the investigative economies of certain species-specific antigens, and, above all, to urge the necessity for further correlation of antigenic analyses with the factors of immunity to natural infections.

## THERAPEUTICS OF DRUG HABITS

BY ALEXANDER LAMBERT, M.D.\*

IT was with genuine pleasure that I accepted the kind invitation to appear before your Harvey Society and discuss for you my experience in the therapeutic care of certain drug addicts. I realize that I am deviating from the usual run of scientific research not to offer you some added facts for your use in the diagnosis of disease or draw your attention to certain new viewpoints in the course of the morbid processes, but it seems wise to me for physicians to discuss, occasionally, the therapeutic care of the sick.

In the last thirty or forty years, as the accuracy in diagnosis of disease has increased and our knowledge of the morbid processes, which we group together as diseases, has been more accurately appreciated, the scepticism in the profession of the value of medicinal treatment has also increased greatly. This has been an advantage in some ways, but it has had the disadvantage of driving many patients to the care of various cults or to self-medication, based on the attraction of the advertising of the drug manufacturers.

Drug habit is best defined as the habitual use of any drug for the purpose of avoiding the emotional strains of life which are too intense for the personality to support. To confine drug addiction to the persistent habit of the use of the opium derivatives is altogether too narrow a conception to be of any real medical value.

The least severe strains of life are those which cause sleeplessness, and the drugs taken for relief are the hypnotics. The more severe strains are those in which narcotics are used either alcohol or opiates. The relief demanded and obtained is often a psychologic necessity.

It is a noticeable fact that, when seeking or obtaining pleasure and recreation the loss of sleep is thought but little of, and the ability to lose sleep and the next day go on with one's existence is often a matter of pride. But, when the worries of life are so severe that they inhibit sleep and one must toss and worry and vainly strive to forget the day's strains and troubles, the loss of sleep is looked upon as a severe misfortune and a strain that cannot be borne without immediate help. The average person can face life fairly well if he can obtain sleep and be ready to face his work when daylight comes.

One of the oldest hypnotics, and really one of the best, is chloral hydrate. In the sleep obtained with it the patient can wake naturally and drop off to sleep again. The drug is especially good in the early years of life. It has a habit connected with its use and, two or three generations ago, its use was a common habit through which weary people could obtain relief without using either alcohol or the opiates to excess. It suffices in most instances but it has the peculiarity, if given to old people of causing a type of sleep-walking in which the patient becomes active in the middle of the night be-

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ing unable to separate the sleeping from the waking consciousness. The patient wanders up and down the room or goes running through the hall noisy and perturbed, and is utterly unconscious of so doing. These patients worry the household but frequently the next morning consider that they have had an excellent night as they have no memory of what they have done.

The habit obtained through the persistent use of chloral was formerly considered a very difficult one to break, chiefly because at that time the profession did not understand the psychological basis on which the habit was formed. But in reality it is no more difficult to cure this habit than any other one of a similar type from the hypnotic drugs. Chloral is often used in combination with the bromides. The latter persisted in produce a deterioration in the normal judgment of the patient. The bromides may produce delusions, so that the patients become inaccurate in their statements and ideas and may even go into a definite drug psychosis. Bromides are much more apt to produce this effect than they have been credited with in these conditions, and the recovery from bromide poisoning is slow.

The most common hypnotics of today belong to the barbituric acid group, which began a little over twenty years ago with veronal. It has run through a large number of variations in which each chemist has endeavored to substitute some variation in chemical constitution that would leave the hypnotic powers intact or increase them, and would avoid the very evident evils of the perversion of personality which these drugs can produce. The injury of the barbiturates, when they do poison a patient produces a much greater injury to the personality than do morphine or the other opiates and the deterioration is much more severe and lasting. All patients are not necessarily poisoned by ordinary hypnotic dosages of these barbiturates. Some forms of barbiturates are much more likely to poison certain people than others but I have yet to find a barbiturate and I have tried and experimented with most of them which will not distinctly poison and pervert the personality in some patients. Various barbiturates can be gauged in the intensity of their sleep-producing qualities and in the rapidity in which they are eliminated from the body, reducing the danger of poisoning from their use. But, in several of them, even in therapeutic doses the borderline between safety and danger is too slight to be safe.

Veronal the original drug of this type has in many instances proved to be an evil drug and hallucinations delusions of persecution and an ugly resentful distortion of personality are usual after its habitual use. In the mildest intoxications it leaves patients ill-natured sharp tongued, suspicious and mean-tempered

preferring to say the mean thing rather than the pleasant one and giving the patient a reputation for meanness of disposition which is done in such a natural way that the drug goes unsuspected. The patient carries the full blame when the trouble is in reality a real drug poisoning and the patient is unconscious of the perversion which the drug has produced. Veronal and other forms of the barbiturates are not infrequently used with suicidal intent and large doses produce coma lasting many days, from which it is difficult to rouse the patient.

When a psychosis has once been established through the use of the barbiturates it takes weeks, if not months, to bring about recovery under the best conditions of institutional care. The treatment for this form of drug poisoning in the acute cases where the perversion is noticeable but of mild extent is to change the form of barbiturate or, better, to change the hypnotic, seeking for one that will not produce the same heaviness of head in the morning or the same intense disagreeable reactions to the ordinary situations of life. The physician should be alive to the fact that changes of disposition in his patients may be due to the drug which he gives and not to the patient.

In severe genuine poisoning by the drug the patient may become utterly irresponsible in his actions inco-ordinate in his muscular movements and entirely unable to go on with his ordinary existence. The amount that these patients can take seems phenomenal when one considers the ordinary dosage that is necessary for hypnotic use. I had a young patient a medical student who had acquired the habit of easing the pain of infected sinuses with codeine. He was taking daily 28 grains of this opiate and had added to this the barbiturate acid preparation nembutal which as you know is usually taken in capsules of  $1\frac{1}{2}$  grains each. In order to obtain sleep he was regularly taking 24 capsules a day that is 36 grains a day. He was reduced to an ordinary stupid dilettante in all he attempted to do. The rapidity with which this special type of barbiturate is eliminated had saved him from a severe poisoning and it was necessary only to cut off his barbiturate and to rely on the codeine until he had reached his normal equilibrium of activity, then proceeding as we shall see later to cut him off the opiate.

Many patients are not so easily relieved of their drug. Sodium amylal seems to be a very favorite form of drug habit because it is a vigorous hypnotic. It has the peculiarity in many people that when they awake for a few minutes they do not clearly separate their waking from their sleeping consciousness and are very apt to be pugnacious and to harm people. We tried this drug in the Bellevue Hospital to relieve the distress and pains of the with-

drawal symptoms of morphine. Several vigorous underworld addicts woke up from their sleep and, before they could be quieted down, had destroyed most of the furniture in their environment and required the full attention of all the orderlies. Its intravenous use is a favorite method with some of those addicted to it. These individuals will have a disassociation of consciousness with complete forgetfulness, but, as one converses with them, they seem to be only slightly intoxicated. They are inaccurate, of course, as in other intoxications, in their speech and in their ideas, but not enough to make one realize the absolute disassociation that has taken place. The next day, when they recover from their sleep, they will have absolutely no recollection of what they have done or said.

Some patients can take enormous doses of sodium amytal ingested orally. One patient I have had was taking, when she was brought to me, 30 capsules a day of the 3 grain capsules. She could not go on without it and, if suddenly deprived of it, suffered from severe convulsions. This patient was incoherent in speech and inco-ordinate in her muscular actions, her face was so changed from its normal expression that she looked like a wild, idiotic type of person although normally of a fine character. This patient was deprived of her drug, has remained free from it and is living a happy, normal life.

An excellent treatment for these severe barbiturate poisonings is the use of picrotoxin, the bitter principle from the seed of *Cocculus indicus*. It is obtainable in ampules containing 3 mg in 1 cc. Its physiologic action is a respiratory and vasomotor stimulation through the medullary centers. It can be administered intravenously, subcutaneously or orally. If the barbiturate poisoning be from a large dose of a quickly absorbed barbiturate as pentobarbital, pernocton, amytal or alurate (the barbiturate of allonal), a large single dose, as 1 or 2 cc., of the above solution intravenously is recommended in a person of 150 lbs. If there are no toxic symptoms of twitching of the arms, increased respiratory rate or rise in blood pressure from this, the dose should be repeated in twenty minutes. As the patient improves, the medication can be given orally in the dose of 3 mg at varying intervals until the patient is lucid. In the poisoning by the slower acting barbiturates, such as phenobarbital, noctal or barbital, the medication can be given orally or subcutaneously in a dose of 6 mg, followed by a 3 mg dose after an hour and continued at such intervals until the barbiturate poisoning is evidently passing off. In chronic poisoning, 3 mg every six hours is helpful in detoxicating the patient.

In the patients who remain unconscious or

have been in coma for one or more days, it is wise to give immediately intravenous injection of glucose, giving 25 cc of a 25 or 50 per cent solution. Such medication seems more effective if subcutaneous injections of insulin are also given. It is wise to take for granted that these patients have some insulin of their own and, instead of giving the exact amount of one unit of the insulin for every 2 gm of sugar, to give two thirds of the amount. These intravenous injections of sugar can be given once or twice a day. They keep up the nourishment of the patient and are well borne. As these patients are recovering from their chronic or acute poisoning, they are nervous and apprehensive and their nervous systems seem generally unstable. This instability, chiefly of the autonomic nervous system, is very much calmed and improved by the use of a new drug, diphenylmethylpyrazonol sold under the name of "rossium." It is a double molecule of antipyrin and the dosage here is a gram every four hours.

A new type of hypnotic, which is proving of value, does not depend on barbituric acid for its action. In this group are the various combinations of carbamide, which have been produced, one, bromural, is a mild hypnotic and another is sedormid, which possesses a certain quality that the barbiturates do not seem to have. In some people the barbiturates are effective to produce sleep, but do not have, in small doses, a sedative action which quiets the patient and often gives sufficient soothing effect for sleep to come naturally. In moderate doses these carbamides are effective for the sedentary effect is pronounced and, unless too much is taken, the heaviness of the morning after is not marked. If too large a dose is taken of these carbamide hypnotics there is a very decided heavy headiness, a dullness of mind and even a blurring of speech. They do not seem to pervert the personality except in very large doses. One patient of mine collected eighteen tablets of sedormid and took them at one dose, because he wished to get, as he said the full effect. This dose produced delusions and an active delirium. At the end of four days, when he regained his mental equilibrium his curiosity was thoroughly satiated.

The general treatment of all these problems which bring about various intensities of hypnotic drug-taking lies in the emotional training of the patient. In general it is the unsolved problems of life which produce the restlessness and cause both the sleeplessness and many other problems of existence. All worries and problems of life cannot be solved by the physician but he can help the individuals to overcome their own problems and to realize that the solution is obtained only by facing and not by dodging them. Of course, all marital misfits cannot be solved even by facing the facts and all the pettiness.



mean self-centered selfishness cannot be entirely rearranged but facing the situation will solve it quicker than the incessant use of hypnotics. If this is done and the cause is realized many patients that now go untreated and become poisoned will be relieved of their worries and their drug addictions simultaneously.

The problems of life, which seem at times to defy solution, are those for which alcohol and the opiates are taken. The fundamental basis of alcoholic drunkenness and morphine addiction is essentially the same. The periodic alcoholic who, at varying intervals of time drinks to dumb forgetfulness does it, on the same psychologic basis as the morphinist who takes his drug habitually to avoid the unhappiness or responsibility that he is unable to face. The blame does not rest on a weak will as is so often claimed, but it is a question of emotions. When the emotions are too disagreeable and too intense to be harbored either temporary or continuous relief is sought in alcohol, or permanent relief is obtained through morphine. The habitual indulgence in these two drugs has been universally looked upon as a moral degradation. Curiously enough, in those countries in which alcohol is more or less condoned the opiates are condemned. In the Western nations and Japan, alcoholic indulgence is condoned, but morphine addiction condemned, in China, India and the East, opium is condoned, but alcoholic indulgence is condemned. It is therefore a question of custom and convention not of morals, which controls and each country by condoning the narcotic relief which unhappy humanity demands, condemns vigorously all those who do not conform in their choice of narcotics to the customs and conventions of that country. It is perhaps best summed up by saying that, in the tragic conflict between what man has been taught he should have and what in life he has been allowed to obtain, man has found in alcohol and other drugs sinister but effective peacemakers.

Alcohol, when taken to excess produces changes in the parenchymatous cells of certain viscera, and, following this destruction there is a connective tissue replacement. It therefore leaves a permanent injury behind its excessive use. Morphine, on the other hand though indulged in for years leaves behind it no recognizable pathologic change, it seems to be a functional cellular poison. When the morphine is taken away, the nerve tissues which were poisoned return to normal function. Clinically an alcoholic patient, who has suffered the morbid processes of a Korsakoff syndrome is left with a personality, the finer emotions and values of which are hopelessly burned out. That personality never regains its former charm and previous sense of emotional values. There is no such

change in the personality remaining after a morphinist has ceased to use his drug and his physical health has been regained.

Alcohol's earliest toxic effect is shown in its atrophy of judgment, and its hypertrophy of self-conceit. Of course, the exact degree of sensitiveness varies with each individual, and it rests upon the ability of the liver or some other tissues to hold back the alcohol from going into the circulation. But, when once the circulating blood holds a certain definite percentage, alcohol will go to the brain and the brain will soon absorb the same percentage. One part in a 100 does not produce drunkenness a little over two parts in 100 produces the beginning of an expansive feeling and by the time that three parts in a 100 are present, all human beings are drunk. The "strong head" of common parlance lies somewhere else in the body than in the brain and signifies that that individual possesses a power not yet understood which keeps the alcohol away from the brain. In judging excess it may be said that, if an individual is saving things he would have otherwise left unsaid or doing things he would, without alcohol, have left undone alcoholic moderation has been exceeded. Such a physiologic excess of alcohol, if continued is sure to bring harm or injury to the mental and physical make-up of that individual.

Considering the use of alcohol as a narcotic, there are distinctly two types of alcoholic excesses. In youth alcohol is more often used to cut off emotional inhibition and the feeling of restraint which prevents the freedom of speech and action which customs and convention inhibit. In order to enjoy life more abundantly and to know through its own experience youth vigorously resists authoritative restraint and uses alcohol to obliterate, or at least to inhibit, such restraints and to be free to experience for itself the full emotional rush of life without intellectual inhibition. In youth imagination and emotion enormously predominate over intellectual balance and over the controlling influence of judgment for judgment, the most valuable of mental attributes, develops the most slowly. Drunkenness when it occurs, is therefore, not what is desired, but a side-product of the use of the drug. In the majority of instances, experience soon teaches that this form of alcoholism is neither the answer to life nor the solution of its problems. With this lack of value, it is usually discarded.

To those who have never had to adjust their emotional balance to their environment and their life, or to those who have unsuccessfully tried, the use of alcohol is the easy method of balancing a mental deficit. It cuts off the sense of inferiority and blunts the sense of failure. When under its influence it above all drugs gives the sense described by Jack

London as that of "White Magic"—whatever is done or said, no matter how insignificant, seems to be the most perfectly done and the most brilliantly said. Individuals sensitive to alcohol drift unconsciously into its habitual excesses. Frequently a single drink is sufficient so to distort their judgment that they go on into an excess which may end in several days' debauch. The social customs of our race are such, and have been from time immemorial that alcohol goes with good fellowship and hospitality, and not a few persons, sensitive to alcohol, drift into an excess that is unconscious and not of vicious origin. By the time a man reaches the early thirties, he knows whether his opportunities offer him a success which he can obtain through vigorous struggle. This means hard work and self-restraint and cannot be won with an alcoholic handicap added to it. It is at this age that the greatest number of young men, if they have been drinking to excess, give up their alcohol. If they do go on, they pass into the psychopathic group, in which, like older men, they drink to forget. The older group of alcoholics, who have been through life and felt its failures, have been through unhappiness and felt its bitterness or, through some uncontrolled factors, have failed of success find in alcohol its full narcotic value and they learn to use it for its pure narcotism. These men do not get drunk because they drink, they drink that they may get drunk and obliterate all consciousness. Alcohol from time immemorial has been the last remaining solace to those who go down in defeat.

In treating alcoholic patients it is useless to argue with a mind that is poisoned with alcohol. It is a waste of time to appeal to or try to rearrange the befuddled intellect, hoping to obtain any balance of emotional control. The first thing to do is to put him to sleep and to see that he sleeps quietly long enough to unpoison his nervous tissues and to free his body from his narcotic. As soon as possible a vigorous mercurial purge should be given which aids enormously toward this result. Ordinary hypnotics in ordinary doses are insufficient to deal with patients poisoned with alcohol. Paraldehyde is one of the best drugs, disagreeable as it is with its unpleasant odor on the days following. Two drams repeated in half an hour, if the patient is not asleep, is a moderate dose for the average patient. This is better given with orange juice and a little whiskey, which takes the repulsive taste away from it, or it can be given simply with orange juice. It can also be given in plain cold ice water. This drug has the advantage of acting quickly. A combination of 25 to 30 grains of chloral, 1 to 2 grains of codeine and 30 minims of the tincture of hyoscyamus at a dose is another excellent hypnotic. This should also con-

tain with each dose, a few drops of tincture of capsicum and tincture of ginger, or some such stomachic which will stimulate the stomach to absorb. An alcoholic gastritis is notorious for its inability to absorb medication and the gastric mucous membranes should be stimulated to absorb with each dose.

Most of the barbiturate acid group of hypnotics, if given in the amount necessary to put an alcoholic asleep, will, in my experience, cause an increase of resistance and antagonism which the alcoholics so easily show. They become unco-operative, and, an alcoholic, feeling sick, unhappy and in an ugly resistant mood, is a disagreeable patient to have anything to do with. It is useless, in my mind, to add to the difficulties of the situation in dealing with them. The alcoholics are always too eager to grasp at any excuse by which they can dodge the responsibility of freeing themselves from their narcotic and the barbiturate acid group of hypnotics is very prone to add to the normal obstinacy and resistance of these patients. The alleged thirst for alcohol, as far as its physical exhibition, occurs only in the first twelve or twenty-four hours after a debauch when they are recovering. The patient usually has obtained the temporary relief he has sought and is disgusted with himself. As his intelligence begins to control him, he is anxious to be rid of his alcohol and to be helped to cut it off as quickly as possible, but, many of them cling to the narcotic as long as they are permitted.

Recently I have used a new drug, diphenyl methylpyrazonol (rossium), to quiet the excessive nervousness of alcoholics and even shorten the period of mental aberration in the delirium tremens. This given in gram doses every four hours does seem materially to shorten these excessive nervous symptoms. I shall discuss the drug more fully in dealing with the morphine habit.

It is useless to annoy the alcoholic you are tapering off with many little drinks of whiskey. If you decide to taper down rather than cut him off abruptly, it is wise to give him a comfortable drink of 2 ounces at a time at stated intervals. He will sober up much more quickly than if you annoy him by handing him half an ounce at a time. The younger the patient, the more abrupt should be the tapering.

Nearly all excessive periodic drinkers, especially women, drink from the pathologic point of view. There is something in their consciousness, the bitterness of which they will not, or cannot, face. In youth, it is usually the disappointed affections or the tragedies of personal friendship, as men grow older it is more often the failures in the economic side of life and their inability to succeed or disappointed ambitions which crowd in the foreground. All through life it is the maladjustments to life

den injuries and hidden distortions which must be sought for and worked out, but, it is invariably a psychologic rearrangement that has to be made. Most of humanity are concrete thinkers, unable to abstract their ideas. It is difficult for them to appreciate that it is the emotional impulses of life which are the mainsprings of action and that they can be just as wilful and strong-minded to get and take a drink as they can be to resist or to do anything else. Thus they do not wish to realize, but incessantly look for some excuse or some reason to dodge this responsibility of emotional control. They therefore turn toward concrete ideas and believe that there must be some method of treatment or some substance which, if handed to them, will prevent their drinking. In this, their friends and relatives agree with them, and believe you to give them some secret thing, which will prevent their going out and physically raising a glass of whiskey to their lips. After you have sobered a man up and explained the situation to him and he leaves you to keep again his sobriety, he still will desire and look for a concrete medicine that will act as a chaperon to stop him from doing a physical act.

Alcoholics are among the most suggestible of human beings and for that reason a routine line of treatment appealing to this universal suggestibility will enable them to regain self-confidence and encourage them to try for their own reconstruction. This is the basis of a large number of definite so-called "cures." Suggestibility is useful as an adjunct to the psychologic rearrangement of the patient, but it is insufficient to obtain its object unless properly applied and made to co-operate with the psychologic rearrangement of the patient. It is impossible to go into all the innumerable psychologic details of each type of personality and their varying conflicts, but, remember this that you will need, in dealing with them, an unending patience, a sense of humor and a cheerful charity toward the frailties of mankind. Also never forget this fact concerning them that these patients will never try to do any better than they think you expect them to do. They are always looking for an excuse not to try and it is in these patients that the human mind best shows its unlimited power of self-deception.

Considering now the morphine addict, in this country morphine addiction is condemned just as bitterly whether it be accidentally acquired through the legitimate practice of medicine against sickness or physical suffering or whether it be through an ennui of life and the inability to face it. All patients are alike condemned by public opinion, there is no charity for a patient who unwittingly finds himself caught in the toils of morphine addiction.

Among the morphinists, more than with the alcoholics you find those who began life with

inadequate personalities—those whose environment has forced on them a bitter realization of poverty and lack of opportunity and in whom the struggle for existence seems hopeless from the very beginning. Morphine forms in that type of inadequate personality a balance which enables them to muddle along in an existence whose bitter edge is blunted. In any group of opiate addicts found in the hospitals today a high percentage of inadequacy of personality will be a striking factor. The really average normal personality in such a group will average about 13 per cent, the rest of them vary in their degrees of inadequacy. A noticeably large number will show a tendency toward dementia praecox which brings with it the factor that they never can get in touch with existence to solve their problems. They are sensitive and easily hurt. They are cold-blooded and selfish in their actions toward others and unable to face reality, they quickly seek a drug by which they can avoid it all. There is a certain other group of inadequate personality which is very noticeable. These patients are not insane and, although they may be sufficiently intelligent to succeed in life, their intelligence however keen, seems unable to control their emotional life. When their minds are filled with antisocial resentment, they easily fall victims to the chronic indulgence of opiates or alcohol. The problems of this group must be solved by Government control and will be referred to later. Members of the manic-depressive group are more in touch with their existence and are not so liable to form the morphine habit. The recurrent type of manic psychoses forms a large number of periodic alcoholic patients and also a smaller number of those addicted to morphine. They take these drugs to keep up their excitation as the manic excitement begins to subside, they end either with a spree in alcohol or if addicted, to morphine or heroin. They resent being deprived of their drug and soon relapse.

There is a great difference between the patients who have taken opiates for physical pain and those who have taken them for psychogenic reasons. The prognosis is vastly different. Those, who have found themselves cursed with the morphine habit unknowingly through pain, will at the earliest opportunity endeavor to be rid of it. They dread its continuance, they resent the fact that they have it and are eager to be relieved. In most instances it has been the excessive pain, misery and discomfort of the withdrawal period that has kept them from getting free from their habit. It is pretty nearly impossible for people to get themselves off without help. It can be done and I have seen several do it, but it is very unusual. It requires great tenacity of purpose, great ability to suffer pain and great courage, but, when once off, this group of patients will almost invariably

stay off, unless then pain returns or they are given morphine unwittingly.

For years there have been many facts observed in the acquisition of the morphine habit, and many peculiarities concerning it that have defied explanation. The opiates are not like other drugs. They cannot be taken like an ordinary dose of atropine or of hyoscin for long periods and be dropped with no reaction. Every normal individual who ingests morphine in small doses for a certain length of time invariably acquires the so-called habit—that is, he will go through such a period of discomfort and misery that it is exceedingly difficult for him to cease taking the morphine. These symptoms of withdrawal last for about seventy-two to ninety-six hours and, then, cease of themselves. Why is it that a patient can take morphine or any opiate in daily injections for a week or two weeks, even up to eighteen or nineteen days, and can cease to take it without withdrawal symptoms, whereas, if the morphine is continued up to twenty-three or twenty-five days, that patient will find himself facing the distressing withdrawal symptoms? Codein will form the habit in the same way, but requires a much longer time than morphine. In ordinary doses, a patient can take codein for a month or six weeks before acquiring the habit, but if it is used to replace morphine, the patient acquires the habit more quickly. Heroin, diacetylmorphine, apparently will produce a habit in about a week or ten days if taken in ordinary doses. Dilaudid takes a little longer than morphine. Any opiate which possesses the power of obliterating pain and producing a sense of euphoria will, with rare exceptions, give the withdrawal symptoms similar to those of the morphine habit. Dionine, ethylmorphine, gives no sense of euphoria and yet will produce the habit much quicker than codeine. Paramorphine, dihydro morphine, produces a marked euphoria. It is weaker than morphine in its analgesic properties and yet requires a longer time than codein to produce the habit. The other new preparations of codein and of morphine should all be used with the same precaution as morphine against the habit.

The human organism tolerates astonishingly large doses of morphine in an addict without noticeable symptoms of acute intoxication. Some patients take daily from fifteen to twenty times the lethal dose for a normal person. I have seen a patient take 60 grains of morphine three times a day without discomfort and without apparent injury. Why do not these patients die from the intoxication of morphine? The word "habit" does not explain it. The morphine addict has a certain definite dose to which he becomes accustomed, but as time goes on there is a slow and increasing demand within him for an increase of the dose. If he does take a larger dose than normal to tide

him over some period in which he cannot get his morphine, the added dose does not give a proportionately added period of time in which he is comfortable. Ostromislensky reports that in some addicts there is a very definite minimum dose of morphine needed to prevent them from suffering the symptoms of definite morphine hunger and that this dose can be measured with precision to within 13 milligrams. After a patient has been through the withdrawal of morphine and apparently relieved of his need for the drug, he actually differs from the normal individual, since, even after several years, a subcutaneous injection or ingestion by mouth of an insignificant dose of morphine given unknown to the patient, may produce a relapse of his addiction.

The minimum dose of morphine needed by an addict may be replaced by quite a definite quantity of some derivative of morphine or other opiate. One unit of morphine is equivalent to the addict to 8 units of codein, to one third of a unit of heroin or to one quarter of a unit of dilaudid. Furthermore, the ease with which one can withdraw the opiate is vastly more in proportion to the length of time the addict has been taking his drug than it is to the amount that he has been taking. It is no more difficult so far as the suffering of the patient is concerned, to withdraw 30 grains a day from a patient, than it is to withdraw 10 grains or even 5 grains, but, it makes a vast difference whether he has been taking it for less than a year or whether he has been taking it for ten or twenty years or longer. Why is it that, in dealing with this poison, the distressing and ominous symptoms, which may even cause a fatal outcome, appear in the addict after the withdrawal of the poisons? At the height of an addiction, morphine produces no pleasant excitement and no blissful repose, and, yet, in the normal individual the narcotic effects occur almost without exception.

Another interesting fact is that a baby of a woman addicted to morphine not infrequently will show at birth the need of morphine and will die unless it is given to it. The baby will live and thrive on a small dose of opiate and this should be kept up regularly until the child is old enough to stand withdrawal. At such a time the opiate can be easily withdrawn and the child will have a healthy life. I have personally taken care of two such children, one little girl of nine years and one of fourteen. They both went through the withdrawal of their addiction very easily and went on to a normal existence. Each of these children had been taking laudanum from birth.

Of the various older theories about morphine addiction, that of Bishop best explained the clinical facts. He believed that morphine injected into the body produced a special substance which he designated as an antitoxin and

that this antibody reacted with the morphine and prevented the injury to the organism by the morphine. In excess, this antitoxin produced withdrawal symptoms hence the necessity of continuous doses of morphine in the addict. This theory helped to explain a good many of the above facts but it failed to explain the fact that when a patient is once relieved of this addiction, years afterward the ingestion of even a small dose of morphine may again cause the habit to be rapidly formed. Moreover all attempts to isolate this antitoxin have failed and Pellini has shown that the blood of morphinized dogs contains no poison at the time of withdrawal.

Among other theories, that of Ostromislensky is today the best working hypothesis. This physician believes that morphine addiction is an example of allergy. The antigen necessary to produce this condition is not the morphine itself but a combination of morphine with some body protein. This neutralizes the morphine and the combined antigen in the early stages of the morphine taking circulates harmlessly. Until sufficient antibody is formed to act with this combined antigen, addiction is not produced and withdrawal of the morphine will not cause symptoms. The antigen or the antibody in small doses or the combination of antigen and antibody in the early days of their formation do not seem to cause sufficient reaction to poison the individual. The antibody is a permanent formation in the nerve tissues or elsewhere, which can remain there for years. If morphine is ingested combined antigen is produced which, meeting again with the stored up antibody, again produces the habit, even when the morphine is taken without knowledge of the patient. The withdrawal symptoms of morphine are an exhibition of anaphylactic shock. The excess of antibody does not cause the shock. The combined antigen is lacking the morphine constituent and it is the combination of the antibody with this unsatisfied antigen that produces the shock. That such a combination of drugs can occur has been shown by the work of Landsteiner, as quoted by Bray in his interesting book on allergy. Antigens have been shown to pass through the placental circulation from mother to fetus. Ostromislensky moreover reports his failure to cause solutions of morphine to pass from the maternal to the fetal circulation of the human placenta.

Ostromislensky, following out this theory as his working hypothesis, noted that Matsuda found that antipyrin phenyldimethylpiperazone prevented the death of guinea pigs in anaphylactic shock. He, therefore prepared a double molecule of antipyrin, making diphenylmethyldipiperazone and called it "rossium". He found that this would prevent death in a sensitized guinea pig that had received from four to five times the usual fatal dose of antigen. On

the hypothesis that the morphinism was of allergic nature and that the withdrawal symptoms were those of anaphylactic shock he tried the use of rossium for the prevention of the withdrawal symptoms of morphine. Of fifty-four new preparations which he made and tested for their ability to prevent anaphylactic shock in animals and for their effectiveness in addicts Ostromislensky found that, although several would reduce the withdrawal symptoms of morphine rossium was the one best adapted for this purpose. Clinically rossium has been found to be an excellent analgesic against intense pain of sciatica and certain menstrual pains. Rossium also has a markedly soothing effect in asthma, which is often of allergic origin. As already mentioned, it quiets the intense nervousness following the alcoholic debauch and seems to shorten the excitement of delirium tremens. It would seem therefore, to be not a specific against the withdrawal of morphine or against the different conditions here named. In all probability it has some action on the autonomic nervous system acting either in a peripheral manner or on the parasympathetic or the sympathetic centers. The balance of the autonomic nervous system is upset during morphine withdrawal, for vomiting, purging, sweating and lacrimation are all symptoms of the overstimulated parasympathetic system. These are the symptoms which are greatly alleviated by the giving of rossium, but the apparent action of stimulation of the parasympathetic may in reality be an inhibition of the normal action of the sympathetic. Those two possibilities cannot be actually separated except by further experimentation. The action of rossium may possibly occur high up in the hypothalamus or in the medullary centers. There are no experimental data yet to prove which it is. It seems, however, most likely that the action of rossium is that of an analgesic on the sensory nerves of the sympathetic system. In some unknown way it preserves the usual equilibrium between the sympathetic and the parasympathetic. We cannot today go farther.

In 1928 the Mayor's Committee on Drug Addiction in New York City was appointed. This committee studied under carefully controlled conditions the action of the various recognized drugs believed to relieve the withdrawal symptoms of morphine. In giving the various treatments a similar number of addicts were taken as controls. These controls were given no narcotics. Graphs were drawn of the intensity of the symptoms of the medicated and of the control patients. We, therefore, obtained a graph showing the symptoms of withdrawal of morphine without narcotics of any kind. This graph of 100 control patients can be used as an accurate comparison for any kind of treatment in the withdrawal of morphine, it remains a permanent record by which to judge other

treatments Judging from this graph, it is evident that the untreated cases of narcotism from heroin or morphine, after an absolute abrupt withdrawal, will begin to yawn and feel weary, when their next dose would ordinarily come due. They begin to have indefinite pains and an uneasiness and nervousness which is indescribable, but very noticeable. After a few hours of this, they become nauseated, begin to have pain in the epigastrium with nausea and vomiting followed by a very active diarrhea, and have severe abdominal and muscle cramps. This lasts without relief, growing more and more intense at night, for the first twenty-four to thirty-six hours. The nervousness and fear increase to such an extent that it becomes a terrific dread of some undefined terror, which is worse and more alarming to them than the fear of death. The almost universal fear of death in humanity is also present and adds to their misery. The gastrointestinal symptoms increase in their intensity, reaching their height on the third or fourth day, then rapidly subside. The muscular discomfort is at its height also on the fourth day and then rapidly improves. The restlessness and psychomotor activity reach their height on the third day, and subside, and the prostration coincides with them. It was found that the use of narcozan, a treatment by injections of a lipid protein, atropine, hyoscin, slow withdrawal of morphine and a seven or a fourteen day withdrawal of morphine did not prevent the occurrence of the withdrawal symptoms. Atropin diminished the gastrointestinal symptoms, hyoscin increased these symptoms and produced an active delirium with severe prostration and weakness. Slow withdrawal was a disagreeable nagging misery, much resented by the patients. The seven and fourteen day withdrawals delayed the certain occurrence of the withdrawal symptoms and slightly reduced their intensity. Codein was the only drug used which decidedly diminished the symptoms. I therefore, devised, as already published, a treatment consisting of increasing the amount of codein as one simultaneously reduced the morphine. The codein was increased up to 5 grains every four hours. After the morphine had not been given for four days, the codein was rapidly cut down in a four-day period. This was the most successful and the least painful of the methods I have used, but it requires a month to six weeks of hospitalization and sometimes ends with a codein habit to be reduced. The old belladonna hyoscamus treatment I used so long is effective but depends after all on codein to relieve the second half of the treatment.

I have used rossium in some seventy-five patients for treatment of addiction to various opium alkaloids. I have also used it in many alcoholics. I have found that the treatment by

rossium successfully reduces the withdrawal symptoms and the period of hospitalization more than any other.

Comparing the withdrawal symptoms under rossium with those under the other forms of treatment, it will be seen that by the method to be described, the gastrointestinal symptoms are reduced to a minimum. The muscular aches, joint pains and abdominal cramps can be controlled by glucose, the nervous restlessness and terrors can be controlled by small doses of codein. The difference of the picture compared with that of the graph of the controls is most striking.

The amount of rossium to be given is governed by the body weight of the patient. Multiply the body weight of the patient by 0.5 and one obtains the number of grams of rossium to be used in the twenty-four hours. If a patient weighs 120 pounds, the dose is 6 grams. This means two 0.5 gram capsules every four hours. This amount of rossium is accompanied during the first forty-eight hours by a sufficient dose of morphine to make the patient comfortable. There is no use in waking the patients between midnight and early morning, for most of them will sleep as long as they know they are not to be deprived of their morning dose. If they are accustomed to sleep the whole night through, it is wiser to give a larger dose of rossium at night and the first thing in the morning in that way obtaining the desired number of grams of rossium in twenty-four hours without waking the patient. The first symptoms of rossium in some patients will be that they begin to perspire, but will feel perfectly comfortable as long as they have their morphine. At the end of about forty-eight hours, at midnight or at the time the patient usually goes to sleep, the last dose of morphine is given, but the rossium is continued. The patients, in that way, will sleep through the first night of their deprivation as usual and this somnolence may last through the following day. They must be awakened during the day, however, to obtain their rossium. After the first sixteen hours of deprivation the sweating will increase in intensity and the patient will begin to feel some aching discomfort. They will feel as if they had a slightly running nose and as if they were having a beginning attack of grip. In some patients there is a slight nausea. Some may have one or two movements of the bowels, but the diarrhea does not proceed beyond that. There may be slight vomiting, but it is not excessive. If nervousness and the apprehension appear and are pronounced, it is wise to give these patients either one half grain of codein every two or four hours or, if the apprehension and restlessness are quite marked, a grain can be given with impunity. It adds to their comfort and it stops any disagreeable symptoms, it does not in any way hinder the



withdrawal of the morphine nor does it possess any danger of the acquisition of the codein habit. I have found useful the fact that each one of the opiates has its own length of time in which the habit is formed. During the withdrawal period the variation in these time schedules can be made a very useful means of playing one opiate against another to relieve the nervousness, insomnia or pain.

Codein is particularly valuable in getting a patient off of morphine, dilaudid or heroin. I have found in the withdrawal of codein that dilaudid is particularly useful and is better than morphine. I have also found if codein does not act or has to be given in large doses to stop the fear and nervousness in the withdrawal of morphine that dilaudid will control these symptoms and can be used without fear of its own habit in the four or five days that are necessary to help the patients in control of their discomfort. If the patients begin to have an aching of the muscles, disagreeable abdominal cramps and pains, the injection of glucose intravenously in a 25 or 50 per cent solution relieves them very quickly. This should be accompanied by the subcutaneous injection of about two-thirds of the equivalent units of insulin. In some sensitive patients, the rossium may cause a slight vomiting on the third or fourth day. If that is so, cut the dosage of rossium to one half.

If the patient is restless and cannot sleep, any hypnotics that will make him sleep can be used. If you desire to use the barbiturate group, those barbiturates which are quickly absorbed and quickly eliminated are the best. The carbamide hypnotics are very useful to soothe the restlessness. Chloral I find in these patients a very useful drug. It can be given in moderate doses, sometimes with bromides. Often in the period of withdrawal, the mixture of hyosem, chloral and codein is very effective. There is one method of giving hyosem that is very valuable and often this drug can be used as the only hypnotic with great benefit and success. It should be given in doses of  $1/400$ th of a gram. It quiets their restlessness and gives sleep at night, but should be given only once or twice in twenty-four hours. Many people, however, are very sensitive to hyosem and, if the patient shows a dryness of mouth and a distinct restlessness after the first dose, do not repeat it. Do not consider that the patient has not had enough. A great many patients, even with this small amount have had too much. But some patients can take with benefit  $1/600$ th of a gram or  $1/800$ th of a gram. I have seen patients that even with a dose of  $1/800$ th of a gram had a dry throat and a restless fear that prevented any use of hyosem.

If patients cannot take the injections of glucose or if it is impractical to give it to them because of the smallness of their veins, orange juice to which an abundance of lactose is added

furnishes the necessary carbohydrate to quiet their restlessness and pain and to improve their condition. Lactose is used here because it is much less sweet than the other sugars and can be taken in larger amounts. I have seen patients supply themselves with a jar of "jaw breakers" and constantly munch them during the day with a great deal of benefit. In the convalescence of the patient from withdrawal symptoms, it is wise to continue the sugar for a week or ten days and to use the hyosem to help them sleep. With several patients, in whom most of the hypnotics were found to be of little value and with whom it was possible to obtain good co-operation, I have told them that it was impossible to make them sleep, but that, if they would make up their minds that they could not sleep, would turn on the light and read an entertaining detective story or anything they chose to read and would do that for two or three nights, they would gradually regain their ability to sleep. If they could get over the idea that they must sleep, or that sleep made any difference to their health, they would soon obtain a beginning of their natural sleep, which would rapidly increase. This was most effective with the younger group of patients, those who were accustomed to late hours and to the realization that they could sit up most of the night amusing themselves without injury. If they could combine that idea with the fact that they had broken the habit of sleeping by their opiates, they would soon be able to sleep naturally. Many addicts have a firm conviction that they will die if they do not sleep and, of course, they are terrified. Such an idea is a psychologic prejudice difficult to overcome, but, if you persuade them that "it is easy enough to lie down and die but it's the going on living that's hard," you will often benefit them.

After the withdrawal of morphine, at odd intervals of one or two or three weeks there is in some patients, a return of a sense of nervousness, which may reach a disagreeable degree, and there may come with it a distinct desire for morphine. If we accept the allergic hypothesis this may be due to an accumulation of antigen combining with the antibody producing a slight flare-up of withdrawal discomfort. This can be controlled with a few small doses of codein. A  $1/400$ th of a gram of hyosem will quiet their restlessness. These periods do not last as a rule more than twenty-four hours and may not occur again. Some patients do not have the return of these periods, others may have them as late as forty or fifty days after they have been off their morphine.

When you have successfully obtained a withdrawal of morphine, do not for one minute think that you should apply the word "cured" to your patient. It is then that you must consider and actively treat the psychologic dis-



tortion of your patient which forced him into morphinism. You will have to reconstruct him psychologically and physically, just the same as you would any worn out, unhappy patient. This is especially true of the psychogenic group. If you find that you are dealing with one of those primitive, unhappy personalities in which the intelligence does not control the emotions you will have a very difficult task. With your patients who have taken morphine because of pain, if you bring them through one, two or several of these annoying recurrences of nervousness and a flare-up of the desire, you can produce a successful cessation of their addiction and you will see a very happy patient.

In young patients a good thorough course of physical exercise and physical training is very valuable. As your whole basis for the treatment of many of these alcoholic and morphine patients is relief of distortion of emotions, necessitating a reorganization of their emotional life, you will find in those who have, by their training, a grasp of religious values a very valuable and powerful adjunct. To those who are not fortunate enough to possess this sense of values, there must be found some emotion higher and more powerful than the desire for obliteration of reality and the patient must be made to face existence. In professional men and in

men in active life, it is the sense of their economic responsibilities and the fear of detection that will hold them. Among professional patients, where unfortunately a large number of physicians through sickness or exhaustion from overwork are caught in the toils of morphinism, the firm determination of the Government to eradicate the use of morphine among this class of patients is often of great value, through fear, to hold them in check. The patients in the psychopathic groups, of which the underworld addicts are so largely composed, should be under Government control, the same as the insane. The work at Lexington, Kentucky, seems to me as being most judiciously carried on and promises a very real success in the control of these patients. In discussing the morphinist and the alcoholic, I have given you a review of the results of a personal experience of over forty years with these patients. I have tried one treatment after another to improve the care and to diminish the intensely trying period of withdrawal of the opiates. I am offering you here tonight in the use of roscium, a new treatment. It is a new drug and, with it, a new hypothesis has been offered to explain the unsolved problems in the opiate habit. It remains for the future to decide whether this hypothesis remains a hypothesis or will be proved to be a fact.

## MEDICAL PROGRESS

### ADVANCES IN PEDIATRICS\*

BY R. CANNON ELEY, M.D.†

#### Neonatal Mortality

ONE of the most practical as well as important innovations that has recently been introduced as an aid in the reduction of infant mortality has been the employment of the roentgen ray (1) as a means of determining the size, i.e., weight, of the fetus. By this procedure the viability or nonviability of the baby from a physiological standpoint can be accurately determined prior to delivery. In pregnancies complicated by placenta praevia, toxemias, and heart disease, stereoroentgenometric examinations have proved of inestimable value in determining the "risk" for both the mother and the baby. There can be little doubt that the progressive reduction in neonatal mortality has been due to the decreased number of deaths occurring among prematurely born infants for it is in this group that one encounters such a high mortality rate. Clifford<sup>1</sup> has pointed out that "at the Boston Lying-in Hospital about three per cent of the 3000 deliveries per year result

in the birth of premature infants—yet this three per cent accounts for fifty per cent of the total neonatal deaths." In view of the fact that the majority of deaths among the premature infants occurred within the first forty-eight hours of life, the records of 304 of these infants were critically appraised in an effort to determine the most effective means of approach in reducing this high mortality rate.

The results of these studies<sup>1</sup> have shown that the most dangerous method of delivery "is the present technique of Caesarean section which carries a mortality of 44.4 per cent." However, it appears that the administration of morphine to the mother within two to four hours before the delivery exerts more influence upon the infant, i.e., by depressing the respiratory center, than the operative procedure. In a study of 850 consecutive premature deliveries in which 752 of the mothers *did not* receive morphine within four hours of delivery, the infant mortality rate was 36 per cent as compared with 60 per cent infant mortality rate in the group of mothers who *did* receive the drug within this specified period of time. Clifford<sup>1</sup> has recently made a study of 120,726 consecutive deliveries

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occurring at the Boston Livingston Hospital over a period of time extending from 1873 through 1935 and from this has been able to point out the various factors as well as diseases which influence the mortality statistics

#### *Acute Lymphocytic Choriomeningitis (Acute Aseptic Meningitis)*

This syndrome although previously described in 1926 by Wallgren<sup>2</sup> received little if any attention in this country before 1929 at which time three cases were reported by Viets and Watts<sup>3</sup>. Subsequent to their reports which they termed acute aseptic meningitis, there has developed a widespread interest in this syndrome<sup>4, 5, 6, 7, 8</sup>. Practically all of the cases of acute lymphocytic choriomeningitis reported have occurred among young adults.

The initial symptoms are similar to those of a respiratory infection. However these are replaced by signs and symptoms which suggest the possibility of some infection of the central nervous system. The cerebrospinal fluid is usually under increased pressure clear in appearance or at the most slightly hazy. Quantitative determinations of the sugar, protein and chloride content show them to be within normal limits, microscopic and cultural studies fail to reveal any organisms. Cytological examination shows a pleocytosis varying from 50 to 2000 cells the majority of the cells being of the lymphocytic series. The course of the disease is usually of short duration lasting from eight to fourteen days and as a rule without residual paralysis.

In the course of virus transmission studies on monkeys, Armstrong<sup>9</sup> encountered a virus that produced a train of symptoms in these animals closely simulating the clinical picture of "aseptic meningitis" in human beings. Traub<sup>1</sup> later isolated a virus from white mice which closely resembled the virus isolated by Armstrong, and recently a similar virus has been isolated from four cases by Ravers and Scott<sup>10</sup>. As subsequent immunological and serological studies have shown the virus isolated by these workers to be the same it would appear that this type of encephalitis is a definite clinical entity and not related to the types of encephalitis previously described.

That there may be other virus diseases discovered seems likely as Toomey<sup>11</sup> had the opportunity to observe and study seventy children who developed a train of symptoms simulating those seen in acute benign lymphocytic choriomeningitis within twenty-one days after the development of the first case. It would therefore appear that a number of similar clinical entities may easily be confused with lymphocytic choriomeningitis, particularly acute anterior poliomyelitis and tuberculous meningitis.

#### *Gonorrheal Vaginitis*

In view of the observations of Allen<sup>12</sup> Lewis<sup>13</sup> treated eight children suffering from specific vaginitis with "theelin" and noted that the histological changes produced in the vaginal epithelium of the patients were similar to the changes produced experimentally in the vaginal epithelium of young monkeys. Associated with this change in the type of vaginal epithelium the discharge disappeared and the causative organisms could no longer be demonstrated. These observations were soon confirmed by Brown<sup>14</sup>. Huberman and Israeloff<sup>15</sup> successfully treated five patients by subcutaneous injections, also good results were obtained by Reading<sup>17</sup> when the substance was given intramuscularly. Goldbeig, Minier and Smith<sup>18</sup> treated seventeen children suffering from vaginitis and of the sixteen cases with specific infection fourteen or 87.5 per cent were considered as cured, no recurrences were noted after their discharge from the hospital. Phillips<sup>19</sup> treated thirteen girls, and six weeks after cessation of all treatment, 70 per cent of the patients "relapsed". The results obtained by Witherspoon<sup>20</sup> however, are in sharp contrast to those mentioned above, as this observer was unable to note any improvement in ten patients treated by the injection of amniotin.

Since it is recognized that "theelin" is a potent hormone the question has naturally arisen as to whether the administration of this substance to young girls will prove to be harmful. Miller<sup>21</sup> who recently had the opportunity to perform a biopsy on the ovary of a child who had received 1100 rat units was unable to demonstrate any abnormalities. Nabarro and Signy<sup>22</sup> observed hypertrophy of the breasts in one of their treated cases, the enlargement subsided with cessation of treatment. Witherspoon<sup>20</sup> speaks discouragingly of the occasional secondary sexual changes that may occur during treatment, while others have raised the question as to whether the pelvic hyperemia may not be conducive to an extension of the inflammatory process. An answer to this last objection may be found in a recent publication by Novak<sup>23</sup> who states "the fear that pelvic hyperemia produced by estrogenic substances may predispose to uterine and tubal extension of the vaginal infection is probably more apparent than real". Although the reported results should not be considered conclusive they are of such a nature as to warrant further observations.

#### *Gonadotropic Hormones in the Treatment of Undescended Testes*

In 1930 Schapiro<sup>24</sup> treated thirteen patients with cryptorchism by the intramuscular injection of a gonadotropic hormone obtained from the urine of pregnant women and noted that

in all cases the testes descended into the scrotum more or less completely. Since that date similar results have been observed by Goldman and Stern,<sup>25</sup> Kunstadter and Robins,<sup>26</sup> Sexton,<sup>27</sup> Rubinstein,<sup>28</sup> Abeille and Jenkins,<sup>29</sup> Biosius,<sup>30</sup> Webster,<sup>31</sup> and Dorff.<sup>32</sup> Spence and Scowen<sup>33</sup> obtained satisfactory results in the treatment of eleven patients and have recently published observations on their previously treated cases (after cessation of treatment) and twenty-two additional cases.<sup>34</sup> Their results can best be stated in the following quotation: "Thirty-three patients, aged four to twenty-six years, with imperfectly migrated testes have been treated with the gonadotropic hormones of pregnancy urine (pregnyl) given in doses of 500 rat units intramuscularly twice a week. Both testes descended into the scrotum in six of the bilateral cases and one in four, while in two cases descent has not occurred. In eleven out of nineteen unilateral cases the testis descended, and in two cases with the testes high in the scrotum. Successful results were obtained within periods ranging from two weeks to fourteen and a half months. The testes have remained within the scrotum in nine out of eleven cases followed for one to eleven months after cessation of treatment."

As pointed out by Drake<sup>35</sup> the testes sometimes descend spontaneously and this fact alone makes it difficult to appraise the results obtained by hormone therapy. However, the age distribution in some of the patients treated by Spence and Scowen would contraindicate the possibility of a normal descent. From the literature it would appear that this form of treatment might be tried *before* surgical intervention is instituted *except* in those instances in which there is mechanical obstruction, and which naturally demand surgical care.

### *Meningitis*

Carey<sup>36</sup> has recently reported the occurrence of an unusual type of meningitis in a boy three years and eight months of age. This patient was admitted to the hospital on account of headache and delirium of one week's duration. Physical examination revealed a drowsy, stuporous child with temperature 102.8°F, pulse 130 per minute and respirations 25 per minute. The remainder of the examination was negative except for signs of meningeal irritation as evidenced by nuchal rigidity, exaggeration of the deep reflexes and a positive bilateral Kernig's sign. The laboratory studies were not unusual except for the examination of the cerebrospinal fluid. This fluid reflected the presence of a purulent infection of the central nervous system. However, cultures of the cerebrospinal fluid revealed the presence of a small gram positive bacillus. For the following twelve days from 25 to 50 cc of cerebrospinal fluid were

removed each twenty-four hours and in the first six specimens of this fluid the same gram positive bacilli could be demonstrated both by direct bacteriological examination of the fluid and by cultural methods. At the end of twelve days the patient made an uneventful recovery and was discharged from the hospital. Subsequent psychometric and physical examinations have shown no sequelae to the infection.

At first it was thought that the gram positive bacillus was a member of the diphtheroid group. However, the morphological, cultural, and immunological relationships of this organism to other identified members of the Genus *Listeria* showed that it belonged to the latter group. Human infection with this type of organism is exceedingly rare. Schultz<sup>37</sup> in 1934 reported the recovery of a woman from whose cerebrospinal fluid a similar organism was recovered, during the same year Burn<sup>38</sup> reported the isolation of this type of organism from the cerebrospinal fluid of two fatal cases of meningitis in newborn infants. In 1935, Seastone<sup>39</sup> reviewed the literature concerning these varied human and animal infections and showed that all of the organisms reported could be classified under the Genus *Listerella* group. One of the characteristics of this organism is its agglutination to a significant titre in normal horse serum and this feature may be of diagnostic aid in identifying similar organisms found in human or animal infections.

### *Continuous Intravenous Therapy*

The therapeutic benefit derived from the continuous administration of solutions by the intravenous route has long been recognized in the treatment of surgical and medical conditions occurring among adults.<sup>40 41 42 43</sup> However, it is only within recent years that this method of therapy has been applied satisfactorily to the practice of pediatrics. In the majority of instances its use in the latter group of patients has been confined to the administration of physiological salt solutions and glucose solutions rather than to the administrations of serums, antitoxins, dyes, etc. Karelitz<sup>44</sup> and Karelitz and Schick<sup>45</sup> have reported excellent results following its use in the treatment of "alimentary toxicosis"; Stokes<sup>46</sup> has indicated its value in combating ketosis, and in stimulating renal function, Cohen<sup>47</sup> et al have demonstrated its importance as a means of establishing normal acid-base equilibrium and Nesbit<sup>48</sup> has found it of distinct advantage as a preoperative measure in the treatment of children with upper intestinal tract obstruction. The largest series of patients treated by this procedure has been reported by Ashby and Moore.<sup>49</sup> These observers treated 511 cases with satisfactory results. This method of treatment is *not* without danger, as thrombosis, the introduction of svs

temic infections and the development of local inflammatory reactions may occur. Any vein may be employed for this procedure such as the saphenous vein of the leg or the veins in the cubital fossa. In infants, and particularly the very young patients, the small venules and capillaries of the scalp are the vessels of choice as this site precludes the necessity of dissecting the vein, and will admit a needle which *per se* controls the proper rate of flow. Furthermore, the vessels are stable and there is less danger of the needle being displaced by the infant's activity. It is a good therapeutic measure which should not be placed in disrepute by its careless or indiscriminate application.

### Vitamin C

Although Szent-Gyorgyi<sup>50</sup> had previously isolated a strongly reducing substance from the adrenal cortex which he called hexuronic acid, it was not until the work of King and Waugh<sup>51, 52</sup> that its definite and final identification with vitamin C was established. Following their observations, rapid advances in the study of the chemical nature of vitamin C were made with the result that it was soon obtained in the pure crystalline form, thus affording the means of determining its physiological functions and their clinical application. The recent publication of King<sup>53</sup> concerning its chemical nature and physiological properties is so complete that repetition is unwarranted. Coincident with this progress has been the understanding of the pathological processes encountered in clinical scurvy as described in the studies of Wolbach et al.<sup>54, 55</sup> and Park et al.<sup>56</sup> Other workers have elucidated many important and practical facts. For example, the knowledge concerning the effect of freezing,<sup>57</sup> drying,<sup>58</sup> canning,<sup>59</sup> cooking<sup>60</sup> and storage<sup>61</sup> has made it possible to preclude the possibility of developing scurvy by the accidental destruction of the vitamin during the preparation of foods.

During the past few years many advances have been made in regard to the clinical importance of this vitamin. The knowledge that human beings cannot synthesize ascorbic acid has made it apparent that unless an adequate amount (25 mg in infants and about 40 mg in adults) is ingested daily there will be a gradual depletion of the body stores resulting in the development of clinical scurvy. This is of further importance in the pregnant mother, for it has recently been shown by Jackson and Park<sup>62</sup> that infants may manifest scurvy shortly after birth which of course implies that during the period of gestation the mother's diet has been inadequate. Harris and Ray<sup>63</sup> have demonstrated that infants with a deficient vitamin C intake excrete less of this substance in their urine in response to a standard test dose than do infants receiving an

adequate amount and as a result of such studies it is now possible to obtain evidence of avitaminosis before it manifests itself in the usual clinical manner. Abt, Farmer and Epstein<sup>64</sup> have recently determined some normal values for reduced cevitamic acid in the blood plasma of infants and children, thus offering a method by means of which the nutritional state of the infant relative to vitamin C may be appraised at any time. These observers also pointed out the unreliability of single capillary skin resistance tests or chemical examinations of the urine as indicative of the total amount of vitamin C present in the blood plasma. Efforts have been made by Goettsch<sup>65</sup> to ascertain whether the administration of a single large dose of vitamin C is as effective for therapeutic purposes as the daily oral administration of small amounts. For this purpose four infants with severe scurvy were treated by the intravenous administration of cevitamic acid<sup>66</sup> and compared with a control group who received small amounts of orange juice orally. The results showed that calcification of subperiosteal hematoma occurred at an earlier date in the former group than in the latter. Furthermore, "a single massive dose of cevitamic acid given either in pure form or as orange juice appears to favor healing of infantile scurvy as effectively as would the same total dose given in several daily proportions over a period of eight days." Although the daily requirements of vitamin C have been established for the normal individual, as shown by the fact that quantities over the required amount are eliminated unaltered by the kidneys, yet it is quite probable that infectious conditions may be accompanied by an excessive loss of the substance from the body tissues.<sup>67</sup>

### Hemophilia

As a result of Sakurai's<sup>68</sup> observation that the action of placental "toxins" in reducing the coagulation time of recalcified blood plasma was similar to the action of animal tissue extracts,<sup>69, 70, 71, 72</sup> and the fact that certain writers had suggested that such extracts might possess a certain degree of specificity for the species from which they were obtained, Eley, Green and McKhann<sup>73</sup> investigated the possibility of obtaining a blood coagulant extract from the human placenta. In vitro and in vivo studies have shown that such an extract obtained from the human placenta possesses a potent coagulant factor and that when given by mouth or intramuscularly will produce a rapid reduction in the coagulation time of both the capillary and venous blood. It *should never be given intravenously* as in vivo studies have shown that when so administered the animals die from intravascular coagulation. Nineteen children suffering from hemophilia have

received the blood coagulant extract and in fifteen instances there has been a satisfactory response as evidenced by a reduction in the coagulation time of the venous blood to within normal limits. This reduction is only temporary and treatments have to be repeated. Older children and adults have proved more refractory. This work is still in the experimental stage of development and definite conclusions as to its value cannot be made at the present time.

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## DEFECTIVE VISION DUE TO TOBACCO AND ALCOHOL

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And yet says Dr Krinsky, every eye specialist in every book on eye diseases, gives prominent mention to blindness of varying degrees of severity from the prolonged and excessive use of either tobacco or alcohol in certain susceptible persons. It is extremely important to recognize blindness from tobacco or alcohol because immediate and complete abstinence will often restore vision unless the case has progressed too far. Wood alcohol blindness is permanent and cannot be cured.—*Bulletin, National Society for the Prevention of Blindness*

CASE RECORDS  
of the  
MASSACHUSETTS GENERAL  
HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED  
IN WEEKLY CLINICAL PATHOLOGIC EXERCISES

FOUNDED BY RICHARD C CABOT, M D

TRACY B MALLORY, M D, *Editor*

CASE 22281

PRESENTATION OF CASE

*First Admission* A fifty year old native plasterer was first admitted complaining of abdominal pain

For two years the patient had been troubled by vague epigastric discomfort occurring about three hours after meals and usually relieved by a glass of milk For about three weeks this discomfort was somewhat more severe than previously but was relieved by a liquid medication given by a local physician On the morning of entry shortly after arising he was suddenly seized with violent cramp like pain in the upper abdomen sufficiently severe to cause him to double up He went to bed immediately and noted a dull aching pain in his left shoulder A short time later the initial pain had spread over the entire abdomen but was most severe in the right upper quadrant The pain was constant and was not associated with emesis or other evidence of bowel disturbance

Physical examination showed a well-developed man lying in bed with his knees drawn up suffering from considerable abdominal pain The skin and mucous membranes were dry and the heart and lungs were negative The abdomen was flat and showed a diffuse board-like rigidity There was marked generalized tenderness more pronounced on the right side and in the upper midabdomen Peristaltic sounds were absent Rectal examination showed tenderness over the entire pelvic floor

The temperature was 98° the pulse 92 The respirations were 20

Examination of the urine was negative The blood showed a white cell count of 16 000

Shortly after entry a perforation of the anterior surface of the stomach near the lesser curvature at the junction of the middle and lower thirds was sutured On the second post operative day the patient developed a temperature of 103° and signs considered significant of right lower pulmonary collapse An x ray examination showed this region to be involved by what was more probably a pneumonic process Subsequently he improved considerably

and on the fourteenth hospital day a gastrointestinal x-ray showed a markedly dilated stomach containing considerable fluid Bismuth could not be forced through the pylorus and the antrum appeared markedly contracted Two weeks later having had symptoms of obstruction a posterior gastrojejunostomy was performed The region of the pylorus was not explored because of adhesions In the mid-portion of the pancreas a hard nodular tumor was felt Biopsy from this showed adenocarcinoma The patient responded well postoperatively and was discharged on the forty-fourth day after entry

*Second Admission* four days later

The patient returned without further symptoms for additional surgical treatment

Physical examination showed no abnormality other than the healed scars of the two previous operations On the second day a Billroth II was performed, the stomach being resected distal to the pre-existing gastrojejunostomy Further the spleen and all of the pancreas except for the proximal 15 centimeters lying within the curve of the duodenum were removed Several enlarged firm lymph nodes in the region of the pancreatic tumor were likewise resected Postoperatively the temperature rose to 103° and the patient was quite ill He reacted promptly however improved rapidly and was discharged on the seventeenth hospital day

*Third Admission* twenty-three days later

Following his discharge the patient adhered rigidly to a special diet and his weight increased from 110 to 120 pounds There was considerable gaseous eructation and passage of flatus but no epigastric discomfort About a week after leaving the hospital he began to have attacks of dull aching pain at the right costovertebral angle occurring about five times daily and lasting about 5 to 15 minutes It varied in severity and occasionally awakened him from his sleep It was frequently relieved by lying upon the affected side or by evacuating stool or urine It was always relieved however within five minutes after drinking a glass of milk There were no other significant symptoms

Physical examination showed no essential general change The abdomen was spastic over the entire upper portion and to a lesser degree in the right lower quadrant

The temperature, pulse and respirations were normal

Examination of the urine was negative The blood showed a red cell count of 2 500 000 with a hemoglobin of 50 per cent The white cell count was 15 800 72 per cent polymorphonuclears A stool specimen gave a ++ reaction to the guaiac test A gastric analysis showed a free acid of 20 units and a total acid of 33 A

received the blood coagulant extract and in fifteen instances there has been a satisfactory response as evidenced by a reduction in the coagulation time of the venous blood to within normal limits. This reduction is only temporary and treatments have to be repeated. Older children and adults have proved more refractory. This work is still in the experimental stage of development and definite conclusions as to its value cannot be made at the present time.

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#### PRESENTATION OF CASE

*First Admission* A fifty year old native plasterer was first admitted complaining of abdominal pain.

For two years the patient had been troubled by vague epigastric discomfort occurring about three hours after meals and usually relieved by a glass of milk. For about three weeks the discomfort was somewhat more severe than previously but was relieved by a liquid medication given by a local physician. On the morning of entry shortly after arising he was suddenly seized with violent cramp-like pain in the upper abdomen sufficiently severe to cause him to double up. He went to bed immediately and noted a dull aching pain in his left shoulder. A short time later the initial pain had spread over the entire abdomen but was most severe in the right upper quadrant. The pain was constant and was not associated with emesis or other evidence of bowel disturbance.

Physical examination showed a well-developed man lying in bed with his knees drawn up suffering from considerable abdominal pain. The skin and mucous membranes were dry and the heart and lungs were negative. The abdomen was flat and showed a diffuse board like rigidity. There was marked generalized tenderness more pronounced on the right side and in the upper midabdomen. Peristaltic sounds were absent. Rectal examination showed tenderness over the entire pelvic floor.

The temperature was 98° the pulse 92. The respirations were 20.

Examination of the urine was negative. The blood showed a white cell count of 16 000.

Shortly after entry a perforation of the anterior surface of the stomach near the lesser curvature at the junction of the middle and lower thirds was sutured. On the second post-operative day the patient developed a temperature of 103° and signs considered significant of right lower pulmonary collapse. An x ray examination showed this region to be involved by what was more probably a pneumonic process. Subsequently he improved considerably

and on the fourteenth hospital day a gastro-intestinal x-ray showed a markedly dilated stomach containing considerable fluid. Barium could not be forced through the pylorus and the antrum appeared markedly contracted. Two weeks later, having had symptoms of obstruction, a posterior gastrojejunostomy was performed. The region of the pylorus was not explored because of adhesions. In the mid-portion of the pancreas a hard nodular tumor was felt. Biopsy from this showed adenocarcinoma. The patient responded well postoperatively and was discharged on the forty-fourth day after entry.

*Second Admission* four days later.

The patient returned without further symptoms for additional surgical treatment.

Physical examination showed no abnormality other than the healed scars of the two previous operations. On the second day a Billroth II was performed, the stomach being resected distal to the pre-existing gastrojejunostomy. Further, the spleen and all of the pancreas except for the proximal 15 centimeters lying within the curve of the duodenum were removed. Several enlarged firm lymph nodes in the region of the pancreatic tumor were likewise resected. Postoperatively the temperature rose to 103° and the patient was quite ill. He reacted promptly, however, improved rapidly and was discharged on the seventeenth hospital day.

*Third Admission* twenty-three days later.

Following his discharge the patient adhered rigidly to a special diet and his weight increased from 110 to 120 pounds. There was considerable gaseous eructation and passage of flatus but no epigastric discomfort. About a week after leaving the hospital he began to have attacks of dull aching pain at the right costovertebral angle occurring about five times daily and lasting about 5 to 15 minutes. It varied in severity and occasionally awakened him from his sleep. It was frequently relieved by lying upon the affected side or by evacuating stool or urine. It was always relieved, however, within five minutes after drinking a glass of milk. There were no other significant symptoms.

Physical examination showed no essential general change. The abdomen was spastic over the entire upper portion and to a lesser degree in the right lower quadrant.

The temperature, pulse and respirations were normal.

Examination of the urine was negative. The blood showed a red cell count of 2 500 000 with a hemoglobin of 50 per cent. The white cell count was 15 800. 72 per cent polymorphonuclears. A stool specimen gave a 4+ reaction to the guaiac test. A gastric analysis showed a free acid of 20 units and a total acid of 33. A

guaiac test upon the gastric contents was negative.

A gastrointestinal series showed a postoperative stomach with a gastroenterostomy. There was a large filling defect with sharp outlines, measuring 6 by 6 centimeters, involving the remaining portion of the antrum and the adjacent portion of the stoma. The rugae in the area of the defect were completely disorganized. Another x-ray study showed the same essential findings. The kidneys were normal in size and position and there were no unusual soft tissue masses. A small air-filled stomach was visualized and showed a soft tissue mass protruding from the medial side into the lower end of the gas-filled portion.

On the day after entry the patient began to vomit blood. Constant gastric drainage was instituted and he was given a transfusion. He improved gradually and was discharged on the fifteenth day.

#### *Fourth Admission, twenty days later*

Since his discharge the patient had dull, gnawing nonradiating epigastric pain. This was invariably relieved by sodium bicarbonate. His appetite was good and he continued to gain weight. The stools were tarry in appearance, but he was taking iron medication for his anemia. He also had some low back pain unaffected by motion but somewhat relieved by micturition.

#### *Physical examination was unchanged*

Examination of the urine showed a slight trace of albumin but was otherwise negative. The blood showed a red cell count of 3,370,000, with a hemoglobin of 60 per cent. The white cell count was 13,900, 82 per cent polymorphonuclears. A gastric analysis showed a free acid of 42 units and a total of 57. After ergotamine the free acid was 70 and the total acid 80.

Another x-ray examination showed a Billroth II stomach with gastroenterostomy stoma about 6 centimeters proximal to the end of the stomach. The opening of the stoma was narrow at the beginning of the examination and only small amounts of barium trickled through it. Later this increased and eventually there was no delay in emptying. A pocket of the anastomosed jejunum was opposite the opening and the stomach above the stoma showed a hypertrophic gastritis. Below the anastomosis the stomach exhibited a well-defined ovoid defect. Rugae in the stomach in the region of the anastomosis were markedly thickened and both the stomach and adjacent jejunum exhibited a decrease of normal elasticity. There was slight decrease in size of the gastric defect since the previous examination. The chest and spine demonstrated no significant changes. The patient was discharged two days later.

#### *Final Admission, two months later*

After leaving the hospital the patient con-

tinued his dietary régime and felt quite well although he continued to look pale. About a month before returning he began to have constant and gradually increasing pain in the region of his operative scar. This disappeared on the morning before re-entry and shortly afterward he vomited about four cupfuls of blood. Thereafter he became delirious and did not respond to any questioning. His condition remained unchanged up to his admission. There was no further hematemesis and his bowels did not move.

Physical examination showed a pallid, thin man with gasping respirations. He was somewhat stuporous and did not respond to questioning. The blood pressure was 100/50. The heart and lungs were negative. The abdomen was tense but there was true spasm only in the right abdomen and flank. Peristalsis was present.

The temperature was 99°, the pulse 120. The respirations were 20.

The nonprotein nitrogen of the blood was 48 milligrams and the blood chlorides were equivalent to 107 cubic centimeters of N/10 sodium chloride. The CO<sub>2</sub> combining power was 59.6 volumes per cent and the serum protein 4.1 grams.

While in the hospital the patient exhibited alternating periods of stupor and excitement. He was given supportive treatment and several transfusions, but failed to respond and died on the day following his final entry, seven months after his initial admission.

#### DIFFERENTIAL DIAGNOSIS

DR ARTHUR W. ALLEN. This fifty-year-old man was admitted to the hospital with a perfectly typical story of perforated peptic ulcer. He had had symptoms for three years that were pretty characteristic and it does not state in the record here how many hours he had been perforated when he came to the hospital. He was operated on very soon after admission and an ulcer in the anterior wall of the stomach near the lesser curvature was found perforated and this was sutured. He made a moderately good immediate convalescence but two weeks later began to show signs of stricture at the pylorus and began to vomit his food. At that time x-ray was made showing that he had a total occlusion at the pylorus. Two weeks after that he was operated on again. At this time he had a gastroenterostomy performed rather high on the posterior wall of the stomach. The surgeon who operated on him noted a firm nodule in the pancreas which was biopsied and an immediate diagnosis of adenocarcinoma was returned by the pathologist. It does not say whether it was adenocarcinoma of the pancreas or whether it was metastatic disease from the stomach. Although that is undoubtedly known it is not in the record. It was felt by the man

who operated on him undoubtedly that there was some chance of resecting this lesion at a later date so that after a rather stormy convalescence from the gastroenterostomy he went home forty-four days after his entry. He returned four days afterwards. He undoubtedly had gone home to get his affairs in order and came back for this third and more serious operation.

At the third operation he had his stomach transected distal to the enterostomy and had the diseased portion of the stomach removed probably including the pylorus. The duodenal stump was turned in leaving with the previous anastomosis a situation which we speak of as a Billroth II resection. At this time also his spleen and all of the pancreas except the proximal 15 centimeters were removed. With the pancreas and the tumor that was in it there were some lymph nodes around it that were removed as well. These lymph nodes are described as being very firm to palpation and were undoubtedly considered by the surgeon to be metastatic malignancy. This brings up a good many interesting points. The question of taking out the pancreas has recently come into vogue for various reasons. We have no hesitancy in taking out the head of the pancreas and the ampulla of Vater and so forth in carcinoma of the ampulla of Vater. Whipple and Parsons in the Presbyterian Hospital in New York have had three or four such successful operations. The gallbladder is first anastomosed to the stomach and the common duct ligated and at the second operation you can go in and remove the head of the pancreas and the diseased portion of the duct. This shows that the individual can do perfectly well without pancreatic secretion. In other words on a low fat diet a patient may do reasonably well. If any pancreatic tissue is left at all no insulin is needed. Recently the pancreas has been removed in a good many instances—not total removals but partial resections—for adenoma of the islands of Langerhans in individuals having symptoms of hyperinsulinism.

The reason the spleen was removed with the pancreas in this case was probably to make it technically more simple. Every once in a while in a gastrectomy it is easier to take the spleen out than to separate it from the fundus of the stomach. The spleen was undoubtedly small and the vessels that run through the pancreas are rather difficult to separate without damaging the blood supply to the spleen and undoubtedly it was removed not because it was diseased but because it made the operation easier and safer. He had a stormy convalescence after this large operation but he survived and was discharged seventeen days after the operation was done. He came back to the hospital twenty-three days later.

"About a week after leaving the hospital he began to have attacks of dull aching pain at the right costovertebral angle occurring about five times daily and lasting about five to fifteen minutes." The fact that this pain was relieved by various methods makes it a little difficult to say to what it might have been due. The fact that it was always relieved by a glass of milk would indicate that he very likely had a new ulcer in the stomach or in the jejunum that had developed since his last operation. The pain is not particularly characteristic so far as localization is concerned but it is possible to have ulcer pain radiate to the right costovertebral angle, also, it may have a deeper significance, as we shall see later on in the history.

"The blood showed a red cell count of 2,500,000 with a hemoglobin of 50 per cent." In other words this man had been bleeding from some source.

"A stool specimen gave a  $\pm$  plus reaction to the guaiac test." That without doubt indicates that he has bleeding from the gastrointestinal tract. The fact that the guaiac test on the gastric contents was negative is of no importance whatever. If the gastroenterostomy was open you might have had one negative guaiac quite easily.

He had at this time a gastrointestinal series. I wish we could see these plates and have them interpreted because it would make a good deal of difference in the diagnosis. They describe a filling defect in the remaining portion of the antrum of the stomach. One would suppose that all the antrum was removed at operation. They also state that the rugae in this area were completely disorganized. I think that would mean that this was an intrinsic lesion that developed in the stomach rather than something that was pressing on it from without.

I am sorry Dr. Holmes is not here. We will have to accept the gastrointestinal series as it is printed here, and here is one of the films. I would not dare try to interpret this picture but I agree that this may represent the gastroenterostomy with a little barium filtered out into the jejunum the duodenum having been sutured off at this point, and I should suppose this area would be the lesion that has been described.

This gastroenterostomy opening has almost shut down. This is rather characteristic of gastroenterostomy in carcinoma of the stomach. It becomes occluded very rapidly by the encroaching disease to a point where a great many of us feel that gastroenterostomy in carcinoma of the stomach is hardly worth while because obstruction occurs again so rapidly. We have however definite evidence of hypertrophic gastritis and the stomach showed a "well defined ovoid defect." "There was slight decrease in the size of the defect since the previous examina-

tion." That would have to mean that it was ulcer and not cancer because cancer does not decrease under any circumstances, so far as the defect is concerned, and ulcer very often does.

Now to sum up the last admission. It says that he was pale and thin so we assume that he had lost a great deal of weight since the previous admission. He undoubtedly had had a good deal of trouble maintaining his nourishment, either due to the fact that the gastroenterostomy opening was being encroached upon from within or from without, and he was bleeding. We find at this admission that although he had spasm in the abdomen peristalsis was present, which I think probably rules out perforation of the remainder of the stomach and a peritonitis with it. His nonprotein nitrogen was elevated. His chlorides were within normal limits. His  $\text{CO}_2$  combining power was a little high and the serum protein very low, a dangerously low level. The one criticism that I have in the last paragraph is that he had several transfusions. I think this is one of the typical examples of the abuse of transfusion. It seems like a terrific waste of blood to pour it into an obviously moribund man.

To go over the summary of the entire question, this man started with a perforated gastric ulcer that later caused pyloric obstruction requiring gastroenterostomy with an accidental finding of adenocarcinoma involving the pancreas. Later on they did a resection of the pancreas and resection of the distal portion of the stomach. The question is was this a carcinoma of the stomach with secondary involvement of the pancreas or was it an ulcer of the stomach all the time, and carcinoma primary in the pancreas which later recurred and finally was the cause of his death? Or was it carcinoma of the stomach in spite of this acidity, and did it finally recur in the stomach in a short period and encroach on the gastrojejunostomy causing obstruction with bleeding and death?

DR TRACY B MALLORY We did not want to make any mystery of this portion of the story, Dr Allen. We found a well localized nodule of tumor 3 by 2.5 by 7 centimeters in almost exactly the midportion of the pancreas. There was great dilatation of the ducts of the pancreas behind the tumor, and it was obviously obstructing them. There was no question in our minds that it was a primary carcinoma of the pancreas.

DR ALLEN That helps a good deal. I think we may assume that this lesion in the stomach was not primarily cancer of the stomach but was ulcer and that this man probably had mechanical difficulty with his new opening, partially from the ulcer in his stomach, and it is possible that he did not have any recurrence of his pancreatic cancer. I believe, however, that he

did have a recurrence of his pancreatic cancer, and that the probabilities are at autopsy we will find that that was true.

There is one point that might have been important that was not brought out and that is whether there were any metastases in the pelvis which could be felt by rectum. I think in the final stages that might have been ascertained. The fact that pain radiated through the back would not help us a great deal, because if the pancreas was involved by ulcer it might radiate through the back. I believe that this man had recurrence of his pancreatic carcinoma and that the lesion in the stomach was primarily ulcer and gastritis.

A PHYSICIAN What was the cause of the obstruction?

DR ALLEN That I think was probably more from pressure without than disease within.

#### CLINICAL DIAGNOSES

Perforated perigastric abscess with ? peritonitis  
(Carcinoma of pancreas—Pancreatectomy)

#### DR ARTHUR W ALLEN'S DIAGNOSES

Carcinoma of the pancreas with recurrence  
Gastritis  
Gastrojejunal ulcer  
Gastrointestinal hemorrhage

#### ANATOMIC DIAGNOSES

Carcinoma of the body of the pancreas with metastases to the regional lymph nodes and to the liver  
Gastrojejunal ulcer  
Pulmonary edema, bilateral, marked  
Pleuritis, chronic fibrous, left  
Pleural effusion, slight, bilateral  
Pericarditis, chronic adhesive  
Operative wounds. Suture of the pylorus, resection of body and tail of the pancreas, splenectomy, posterior gastroenterostomy

#### PATHOLOGIC DISCUSSION

DR MALLORY I am sorry Dr Churchill is not here to discuss this case. He performed most of the operations and found by accident a very small and apparently well circumscribed tumor directly in the body of the pancreas. There were about four small nodes involved in the immediate neighborhood but the tumor at the time of the first operation seemed so well circumscribed that he felt it worthwhile making an attempt at resection. The spleen was taken out, as Dr Allen suggested because it made the operation technically simpler and also because three of these involved nodes lay immediately around the splenic vein so that it would have been virtually impossible to dissect out the vein and be sure that you were not leaving tumor behind. The splenic vein on occasions is completely encased in pancreatic tis-

sue and is very often approximately two-thirds or three-fourths surrounded by the body of the pancreas. The complication which was the immediate cause of this man's death was a large gastrojejunal ulcer nearly 8 centimeters in diameter. The tissues around this ulcer were very markedly swollen with an inflammatory process, showing that there probably was an element of pressure from without in producing the obstruction. The pancreatic tumor had not recurred locally but at the time of autopsy we found three other lymph nodes higher up in the posterior retroperitoneal tissue and also a fine studding of small fresh metastases in the liver.

DR ALLEN: I wonder if any of the internists can tell us whether this fat-free diet was a poor ulcer diet.

DR GERAUD BLAKE: If you can keep up the nutrition sufficiently with fat-free diet, as happened here, I do not think it is a bad diet. You depend on fat a good deal in an ulcer diet but it takes support away from you. I think a fairly satisfactory ulcer diet can be made without using fat.

DR MALLORY: The final terminal event was hemorrhage into the bowel. We found the entire intestinal tract completely full of fresh blood. The last hemorrhage had gone downwards instead of upwards.

DR ALLEN: Could you make out a large vessel that was eroded?

DR MALLORY: No, we did not find any single vessel.

DR ALLEN: The only other fatal hemorrhage from a gastrojejunal ulcer that I know about is one that had become attached to the middle colic artery and finally eroded into it so that patient died of a profuse hemorrhage.

## CASE 22282

### PRESENTATION OF CASE

A thirty-eight year old white native prison inmate was admitted complaining of sweating and fever.

The patient, serving an eight year prison sentence, had been well until about five weeks before entry when he was suddenly seized with a severe shaking chill which was followed by fever and profuse sweating. On three subsequent days he had further rigor but thereafter had none. He was confined to bed at the prison infirmary where he remained until his admission. Up to two weeks before entry he had a gradually rising fever in the morning which subsided toward evening. There were however profuse night sweats and progressive weakness. Two weeks before entry the fever rhythm changed and he had an evening fever of 104° and 105° with a morning temperature

of about 96°. He had lost some weight developed anorexia, and became slightly weaker. Otherwise he felt that there was no marked change in his condition since the beginning of his illness. There was some frontal headache, moderate polydipsia and a slight cough productive of a small amount of mucoid material but no other associated symptoms. He had been given a course of quinine therapy without effect. On several occasions just before entry macroscopic hematuria was noted.

The past history is noncontributory.

Physical examination showed a well developed and nourished man with a rather fixed expressionless facies and hot dry skin. The eyes were slightly prominent. The right eyelid was a little puffy and the right pupil slightly irregular. The tongue was heavily coated and the breath had a foul odor. Oral hygiene was poor. The heart was not enlarged. The sounds were of poor quality but no murmurs or irregularities were audible. The blood pressure was 106/58. There was slight dulness at the right base posteriorly with slightly diminished tactile fremitus and breath sounds but the lungs were otherwise clear. The abdomen was slightly distended and tympanitic. No evidence of fluid was elicited. The liver and spleen were not felt although the former seemed enlarged to percussion. There was moderate edema of the ankles and some coarse tremor of the extremities.

The temperature was 104.4° the pulse 110. The respirations were 20.

Examination of the urine was negative. The blood showed a red cell count of 3,600,000 with a hemoglobin of 70 per cent. The white cell count was 7,400, 68 per cent polymorphonuclears, 22 lymphocytes, 3 monocytes, 6 myelocytes and 1 nucleated red blood cell. There were polychromatophilic anisocytosis and many stippled red blood cells. No parasites were seen. The sputum was mucopurulent in appearance, and on one occasion contained blood but was otherwise negative. Stool examinations were negative. A Hinton test was negative. The serum protein was 4 grams. Agglutination tests for organisms of the typhoid group and undulant fever were negative. The blood chlorides were 100 and an icterus index was 3. Blood, stool and urine cultures were negative. A tuberculin test was negative.

X-ray examination of the chest showed shallow costophrenic angles and irregular diaphragmatic outlines. There was slightly decreased radiance in the right cardiophrenic angle and the lung markings in other portions of the lung were slightly increased. The heart lay transversely and was not evidently enlarged. Hilar shadows were wide but no glandular masses were visible. A flat film of the abdomen showed calcified glands overlying the right ilium and evidence of metallic material in the buttocks.

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Now to sum up the last admission. It says that he was pale and thin so we assume that he had lost a great deal of weight since the previous admission. He undoubtedly had had a good deal of trouble maintaining his nourishment, either due to the fact that the gastroenterostomy opening was being encroached upon from within or from without, and he was bleeding. We find at this admission that although he had spasm in the abdomen peristalsis was present, which I think probably rules out perforation of the remainder of the stomach and a peritonitis with it. His nonprotein nitrogen was elevated. His chlorides were within normal limits. His  $\text{CO}_2$  combining power was a little high and the serum protein very low, a dangerously low level. The one criticism that I have in the last paragraph is that he had several transfusions. I think this is one of the typical examples of the abuse of transfusion. It seems like a terrific waste of blood to pour it into an obviously moribund man.

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#### ANATOMIC DIAGNOSES

Carcinoma of the body of the pancreas with metastases to the regional lymph nodes and to the liver

Gastrojejunal ulcer

Pulmonary edema, bilateral, marked

Pleuritis, chronic fibrous, left

Pleural effusion, slight, bilateral

Pericarditis, chronic adhesive

Operative wounds. Suture of the pylorus, resection of body and tail of the pancreas, splenectomy, posterior gastroenterostomy

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DR ALLEN: That helps a good deal. I think we may assume that this lesion in the stomach was not primarily cancer of the stomach but was ulcer and that this man probably had mechanical difficulty with his new opening, partially from the ulcer in his stomach, and it is possible that he did not have any recurrence of his pancreatic cancer. I believe, however, that he

did have a recurrence of his pancreatic cancer, and that the probabilities are at autopsy we will find that that was true.

There is one point that might have been important that was not brought out and that is whether there were any metastases in the pelvis which could be felt by rectum. I think in the final stages that might have been ascertained. The fact that pain radiated through the back would not help us a great deal, because if the pancreas was involved by ulcer it might radiate through the back. I believe that this man had recurrence of his pancreatic carcinoma and that the lesion in the stomach was primarily ulcer and gastritis.

A PHYSICIAN: What was the cause of the obstruction?

DR ALLEN: That I think was probably more from pressure without than disease within.

#### CLINICAL DIAGNOSES

Perforated perigastric abscess with ? peritonitis  
(Carcinoma of pancreas—Pancreatectomy)

#### DR ARTHUR W. ALLEN'S DIAGNOSES

Carcinoma of the pancreas with recurrence  
Gastritis  
Gastrojejunal ulcer  
Gastrointestinal hemorrhage

#### ANATOMIC DIAGNOSES

Carcinoma of the body of the pancreas with metastases to the regional lymph nodes and to the liver  
Gastrojejunal ulcer  
Pulmonary edema, bilateral, marked  
Pleuritis, chronic fibrous, left  
Pleural effusion, slight, bilateral  
Pericarditis, chronic adhesive  
Operative wounds: Suture of the pylorus, resection of body and tail of the pancreas  
splenectomy, posterior gastroenterostomy

#### PATHOLOGIC DISCUSSION

DR MALLORY: I am sorry Dr. Churchill is not here to discuss this case. He performed most of the operations and found by accident a very small and apparently well circumscribed tumor directly in the body of the pancreas. There were about four small nodes involved in the immediate neighborhood but the tumor at the time of the first operation seemed so well circumscribed that he felt it worthwhile making an attempt at resection. The spleen was taken out, as Dr. Allen suggested because it made the operation technically simpler and also because three of these involved nodes lay immediately around the splenic vein so that it would have been virtually impossible to dissect out the vein and be sure that you were not leaving tumor behind. The splenic vein on occasions is completely encased in pancreatic tissue.

ner pelves and calices completely and you should not accept the findings as negative evidence. As far as we can make out the function is all right, but deformed calices could be missed.

DR TOWNSEND Does that show metallic material on both sides?

DR HOLMES Yes. I think that your observation is correct. He had had some metallic injections.

DR TOWNSEND The x-rays confirmed the presence of fluid in the chest and otherwise did not contribute very much directly.

The character of the fluid is that of a transudate, low gravity, very few cells and what there were lymphocytes.

The fluid from the chest showed a gravity of 1.006 and formed a pellicle. Essentially the same character of fluid as from the abdomen except that it formed a pellicle. They do not say it clotted, however, and I should assume from that again that it was transudate due to chemical disturbance rather than exudate from an inflammatory process.

#### DIFFERENTIAL DIAGNOSIS

We are dealing with a febrile illness of seven weeks' duration. The patient ran a septic type of temperature the whole time and progressively became worse until the time of his death. The picture is that of a general septicemia of some sort but practically all the evidence that we have as to the nature of the infection, if it is an infection, is of a negative character. I think the best lead that we have as to the nature of the disturbance is what appears near the end of the history, the fresh hemorrhages in the retina. That is strongly suggestive of an embolic phenomenon and gives us the cue that this very likely might have been bacterial endocarditis.

Is there any other evidence of embolic phenomena to go with it? Back in the present illness on several occasions just before entry he had macroscopic hematuria. I think that is suggestive that he might have had infarcts in the kidney repeatedly, and at each time passed some blood. That however is not confirmed by the finding of blood while he was in the hospital. Then again just before he died there is a suggestion of something intracranial. Something happened rather suddenly, he became irrational, had a very high respiratory rate which again in the absence of a chest condition suggests something intracranial. He also had disturbance of the left pupil, a little increase in the pressure in the spinal fluid and slight blurring of the discs in addition to the hemorrhages. All that, I should try to interpret on the basis of embolism intracranial with increased pressure and some reaction resulting in the slightly increased cell count in the spinal fluid and

increased protein. Aside from that we have very little except the various negative findings which tend to rule out such conditions as typhoid and undulant fever. We have no direct evidence of a heart disturbance in spite of the duration of seven weeks, which is not very long for malignant endocarditis. There were no murmurs to be heard but that does not absolutely exclude the diagnosis. Neither have we good evidence for any previous cardiac disease which we should like to have for a diagnosis of malignant endocarditis, except possibly lues. He also had no enlarged spleen, at least not palpable, and nothing suggestive of other emboli such as in the fingers. The blood disturbance is consistent with that diagnosis but there is nothing absolutely characteristic about it, such as the presence of phagocytic cells. The anemia, the level of the white cell count and the various disturbances of the red cells and white cells are, I think, consistent with that diagnosis.

What other conditions could possibly have caused such an illness? Perhaps one should consider tuberculosis as the next possible cause of unexplained fever. In this case if it were tuberculosis it would have to be miliary tuberculosis. There is very little evidence one way or the other on that point. After seven weeks I should think that an x-ray picture would show some disturbance in the lungs. There is an old focus from which miliary tuberculosis might have arisen from the glands in the abdomen but I would expect there would be something visible in the lungs in the way of miliary tuberculosis. His tuberculin test was negative. This is suggestive negative evidence but not conclusive because there are a certain number of severe overwhelming tuberculosis cases that have a negative tuberculin test.

Are there other disturbances of a nonbacterial character which could give a picture like this? We have all seen cases of lymphoma which run a fever of the septic type usually not quite so continuous or regular as in this case. They usually have periods of fever alternating with periods of normal temperature, and usually some evidences of glandular disturbance turn up during the course of the disease, although it is possible for it to occur in the retroperitoneal glands without showing any evidence on physical examination. The duration of this for a fatal case of lymphoma is rather short and the onset is quite sudden. There is one thing about the blood picture which is rather against the terminal stage of lymphoma and that is the presence of twenty-two lymphocytes. One would expect with a lymphoma which had progressed to this point that there would be a higher percentage of polymorphonuclears and the lymphocytes would probably have decreased more. I think that diagnosis is unlikely.

We have some reason to think that this man

The right kidney was normal but the left was incompletely outlined and its lower pole appeared enlarged. A pyelogram showed a normal right kidney but the left was obscured by gas in the colon. Intravenous dye, however, appeared promptly on both sides and demonstrated normal urinary passages.

The patient's condition continued relatively unchanged. His temperature remained elevated between 102° and 104° but his white blood cell count did not rise above 9,000. He gradually developed increasing edema as his serum protein dropped to 3.2 grams. Signs of fluid accumulation appeared at both bases and in the abdomen. On the ninth day 60 cubic centimeters of cloudy yellowish fluid was removed from the abdomen. The fluid had a specific gravity of 1.010 with a cell count of 60, most of which were lymphocytes. On the following day 50 cubic centimeters of straw-colored fluid was removed from the left chest. The fluid had a specific gravity of 1.006 and formed a pellicle. Thirty-six white blood cells were present, practically all of which were lymphocytes. On the thirteenth day he was obviously weaker. He became irrational and showed a respiratory rate of 50. The left pupil was pinpoint in character and did not react to light. The right pupil was negative. The fundi showed blurring of the nasal side of the discs and a few fresh hemorrhages. A lumbar puncture exhibited an initial pressure of 230 with normal dynamics. The cell count was 6 polymorphonuclears and 4 lymphocytes. Alcohol and ammonium sulphate tests were positive. He became rapidly worse and died on the following day.

#### NOTES ON THE HISTORY

DR. JAMES H. TOWNSEND: I take it that his maximum temperature was a little higher each day and reached its peak in the morning.

"There was slight dulness at the right base posteriorly with slightly diminished tactile fremitus and breath sounds, but the lungs were otherwise clear." In other words, a suggestion of a small amount of fluid in the right chest or thickened pleura.

The respirations were only 20 in spite of the high fever, which strongly suggests that the trouble was not in the chest.

"Examination of the urine was negative." That is interesting in view of the fact that on several occasions he had macroscopic hematuria. I take it that several urine examinations were made and all were negative, no albumin, no pus and no blood found at any of the examinations.

According to the blood counts there was only a slight degree of anemia, of the secondary or hypochromic type. The smear of his blood evidently showed much more disturbance than one would guess from the counts alone. The myelo-

cytes are interesting to note. One wonders what the nature of the sixty-eight per cent polymorphonuclears was, whether there was a high percentage of band forms with those and the myelocytes were just a slightly increased degree of the same thing, or whether the polymorphonuclears were of more adult character.

DR. TRACY B. MALLORY: There is a great deal of difference of opinion in regard to that blood smear. I wonder if the house officers care to speak up.

DR. ROBERT F. WATSON: I think the last one done by Dr. Stewart is the correct one. It shows a higher percentage of immature cells.

DR. TOWNSEND: Evidently there was a good deal of disturbance in the red cell marrow because there was active regeneration as shown by polychromatophilia and many stippled cells.

I take it that the sputum was never large in amount, just a small amount of blood streaked sputum.

"The serum protein was 4 grams." In other words a great deal of loss of body protein as a result of febrile disturbance and we can account for the edema on that basis.

I should like to ask at this point if there were many blood cultures and if they were done with the ordinary media or whether there were special blood cultures done on special media to pick up a rarer type of organism?

DR. WATSON: Three blood cultures were taken. The pleural and abdominal fluids were also cultured, the latter both aerobically and anaerobically, and the urine and stools were examined. The bacteriologist was specifically asked to look for *Brucella abortus*.

DR. TOWNSEND: "A flat film of the abdomen showed calcified glands overlying the right ilium and evidence of metallic material in the but tocks." The only explanation I can offer for that is that at some time someone thought he had lues and he was treated with bismuth. At the present time his Hinton is negative but he may have had enough treatment to render that negative. That is suggestive evidence, however, that he may have had lues.

Would Dr. Holmes like to show us the x-rays at this point?

DR. HOLMES: I do not see any reason to change the interpretation at all from the way it is stated. Possibly there is a small amount of fluid present. Another finding that was not mentioned is that the left diaphragm is as high as the right, normally it should be a little lower.

DR. TOWNSEND: The lung fields were pretty clear.

DR. HOLMES: Yes.

DR. TOWNSEND: An old tuberculous gland. Is that the metallic material?

DR. HOLMES: I think that must be it. It is not very clear.

The intravenous injection does not fill the kid-

from the central nervous system. I came to the autopsy and asked if they had found miliary tuberculosis, thinking that was the most probable diagnosis of those considered but not proved.

#### CLINICAL DIAGNOSES

Fever of unknown origin  
Miliary tuberculosis?

#### DR. JAMES H. TOWNSEND'S DIAGNOSIS

Subacute bacterial endocarditis

#### ANATOMIC DIAGNOSES

Aleukemic myeloid leukemia with involvement of the liver and spleen  
Hydrothorax  
Hydropericardium  
Ascites  
Peripheral edema  
Pulmonary edema, marked bilateral  
Infarct of the spleen  
Cholelithiasis

#### PATHOLOGIC DIAGNOSES

DR. MALLORY: At the autopsy we found the various serous cavities full of fluid, nearly three liters in the chest, as much in the abdomen and generalized peripheral edema. The lungs except for edema were entirely negative. The heart was normal in size and the valves were normal. The liver was very much enlarged, weighing 2,600 grams, very pale, with rather prominent markings. The spleen was moderately enlarged, 400 grams, with numerous infarcts. The kidneys were a little large and edematous.

The bone marrow showed a little wider distribution of red marrow than normally. The findings were not very striking in gross so we were still pretty much in the dark as to what he might have. Dr. Gall, having seen the blood smear a few hours before the patient's death, had become suspicious of leukemia and thought that the gross findings were consistent with an aleukemic leukemia.

The sections proved very interesting because from the bone marrow it was quite impossible to make a diagnosis of leukemia. It showed a very diffuse hyperplasia about equally distributed between the red and the white cell series with a large number of mononuclear phagocytes but the liver showed infiltration of all the sinusoids with typical leukemic cells that are obviously of the myeloid series and the same cells were present in large numbers in the spleen. Although there was no leukemic infiltration anywhere else the only diagnosis we feel we can make is an aleukemic myeloid leukemia with the leukemic manifestations limited to the portal circulation. I have not infrequently seen the localized type of leukemic infiltration in aleukemic lymphatic leukemia but I have not before seen it in a myeloid leukemia in which the bone marrow was not characteristic.

The postmortem blood cultures were obscured by an overgrowth of gas bacillus which I am sure is postmortem, so I cannot say that we absolutely ruled out sepsis. I cannot believe, however, that any form of sepsis would account for the findings.

A PHYSICIAN: Did you examine the brain?

DR. MALLORY: Yes. It was negative except for gas bubbles.

may have had lues. Can we connect this illness with lues in any way? There is a form of lues which runs a continuous septic fever, that is, syphilis of the liver. There again it is not usually a continuous fever, usually periods of fever alternating with periods of normal temperature. We have a suggestion of enlarged liver both by x-ray and percussion and yet I think that disturbance of the liver of this degree should have produced either jaundice or more marked ascites early in the game out of proportion to the amount of fluid in the chest, and I would expect that there would be a definite increase in the icteric index which is not present in this case.

We know that he had quinine therapy. Is it conceivable that he could have been treated for general paresis with malaria and the thing got away from them and they were unable to cure it? I think that is exceedingly improbable. The absence of parasites in the blood and failure of quinine to produce any effect on the disease practically exclude that possibility. I think we should have had some history on that point if such were the situation.

Are there any other parasitic infections? If it were trichinosis, there would be some increase in the eosinophils which is not the situation here. Are there other forms of bacterial septicemia which we should consider? We have more than one negative blood culture which I think is not conclusive evidence of anything. It certainly does not rule out malignant endocarditis. If it were *Streptococcus hemolyticus septicemia* I would expect that the blood culture would pick it up and I would expect also that there would be other evidence of localized sepsis appearing from time to time. No abscess was found anywhere that we had called to our attention. Could it be staphylococcus septicemia? There again I think he would show local evidence somewhere, either in the skin or kidneys and it should have been picked up by blood culture. The meningococcus is more prevalent than usual in the community this year. Could he have had a meningococcus septicemia? That is a rare disease in its subacute form. In the acute form it usually kills within a few days. But there is a form that goes several weeks or months. The organisms are hard to grow and do not show up unless on special media. Usually skin eruptions show up during the course of the disease. Could he have had a gonococcus septicemia? There again it is a rare form of septicemia, grown only on special media. Usually if the gonococcus gets into the blood stream it is apt to cause severe ulcerative lesions of the heart valves which would cause heart murmurs, and that is not the situation here. I do not believe we can diagnose either of these latter conditions but neither can we absolutely exclude them. On the whole, I

think the diagnosis which best fits the picture is that of bacterial endocarditis due to a non-hemolytic streptococcus.

DR MALLORY: Are there any other suggestions as to diagnosis?

DR WYMAN RICHARDSON: I wonder if Dr. Townsend would agree to the suggestion that the anemia might be a myelocytic type of anemia rather than one due to sepsis? I should like to suggest a possible diagnosis of acute aleukemic leukemia.

DR TOWNSEND: I did not mention that Lymphatic leukemia. I should include in the lymphomatous group of diseases. I suppose myelogenous leukemia with normal white count is a possibility. It is unusual for it to run as steady and marked a fever as this. It would be consistent with the hemorrhages in the retina. This idea had occurred to me but I did not entertain it very long, particularly as I hitched up the myelocytes with the increased young forms of polymorphonuclears in the blood. I would rather expect that there would be more nucleated red cells, and a more profound degree of anemia than that present here.

DR MALLORY: I think it is fair to say that no really good blood smear was probably ever seen on the case. We finally collected one and it contained a great many so-called smudge forms which were pretty hard to identify but some of them we thought were probably blast forms, although they evidently were not counted in the actual differentiation on the wards.

DR. GERALD BLAKE: I may tell you a word or two about the man's early symptoms because I saw him two weeks before admission to the hospital, when he had been ill for three weeks. The chief thing that troubled him up to that time was sweating. He had four to six drenching sweats in twenty-four hours. The only case that I have seen sweat to this degree was one of dinitrophenol poisoning. He had a constant low white count between 4,600 and 6,000. He had no particular symptoms when he was not in one of the sweating periods. He had morning temperature between 100° and 102° until the day before I saw him, when it reached 104°, with a subnormal temperature on the afternoon of that day.

He was given quinine as a therapeutic test for malaria and not for any other reason. He looked well except for flushing of the face. He had no localizing signs anywhere that I could find except an inconstant left Babinski. Two weeks afterwards he was admitted to the hospital. Both at entrance and during his stay in the hospital we considered the various things that Dr. Townsend has just spoken of but could not demonstrate any one of them to our own satisfaction. He died of circulatory failure with a few localizing signs that might have been

tion, that Darwin's theory of evolution was due to the imagery created by his gastroenteric disturbances, that the facts of Conrad's experiences were sharpened and amplified by nervous dyspepsia. Less is known about Shakespeare's personal digestive ability, but we may assume that he had some basis on which to mention, in *Much Ado About Nothing*, Benedick's "quick wit and greasy stomach." In fact as we all know, intellectual attainments and peptic ulcer go hand in hand, although it may well be the brain that causes the ulcer that stimulates the brain.

As evidence Dr Todd, having made roentgen ray studies of the healthy stomachs of more than 800 of his students, presents the conclusion that emotional states reduce the stomach's gastric waves of contraction and cause prolonged closure of the pylorus. New students emotionally upset by an unfamiliar experiment had large inactive stomachs, while in later repetitions of the experiments the same students' stomachs grew smaller and more active, indicating that the emotional stress had been eliminated. The definite relationship of these observations to genius is left to the reader's genius to deduce although this need not be difficult, no one will deny that a stomachache sharpens the imagination.

Genius may enter into journalism, but fortunately is not a *sine qua non* of it, and it may give comfort to the *Journal's* readers to know that its Editorial Staff, collectively and individually is blessed with excellent digestion.

### THIS WEEK'S ISSUE

CONTAINS articles by the following named authors

STEWART, JOHN D. B.A., M.D. Harvard University Medical School 1928. Assistant in Surgery and Dalton Scholar, Massachusetts General Hospital. His subject is Fluid Therapy in Surgery. A Critical Review. Page 53. Address: Massachusetts General Hospital, Boston, Mass.

HUDSON, HENRY W., JR. M.D. Harvard University Medical School 1925. F.A.C.S. Associate Surgeon Children's Hospital. Assistant in Surgery. Harvard University Medical School. Address: 1101 Beacon Street, Brookline, Mass. Associated with him is

KRAKOWER, CECIL. M.D., M.C. McGill University Medical School 1932. Acting Pathologist, Children's Hospital 1935-36. Address: School of Tropical Medicine, San Juan, Puerto Rico. Their subject is Acute Appendicitis and Measles. Page 59.

RISEMAN, JOSEPH E. F. B.S., M.D. Harvard University Medical School 1929. Assistant in Medicine. Harvard University Medical School 1931- Research Associate, Beth Israel Hospital 1931- Assistant Physician. Beth Israel Hospital 1936- Address: Beth Israel

Hospital, Boston, Mass. Associated with him is LESNICK, GERSON B.S. Harvard University Medical School, Class of 1937. Address: Beth Israel Hospital, Boston, Mass. Their subject is A Simple Method of Oxygen Analysis for Use in Oxygen Tent Therapy. Page 65.

HOOVER, SANFORD B. A.B., A.M., M.D. Boston University School of Medicine 1913. Member Evans Memorial Immunologist, Massachusetts Memorial Hospitals. Professor of Immunology, Boston University School of Medicine. His subject is The Plurality of Streptococcal Toxins. Page 68. Address: 80 East Concord Street, Boston, Mass.

LAMBERT, ALEXANDER. M.D. Columbia University of Physicians and Surgeons 1888. Formerly, Professor of Clinical Medicine, Cornell University Medical School, Attending Physician, Bellevue Hospital, and President of the American Medical Association. His subject is Therapeutics of Drug Habits. Page 72. Address: 43 East 72nd Street, New York City.

ELEY, R. CANNON. M.D. Medical Department, University of Virginia 1925. Associate in Pediatrics and Communicable Diseases, Harvard University Medical School and School of Public Health. Associate Visiting Physician, Children's Hospital, Boston. His subject is Advances in Pediatrics. Page 82. Address: 319 Longwood Avenue, Boston, Mass.

### MISCELLANY

#### AN HONOR TO DR. W. B. CASTLE

Among the scientists receiving honorary degrees from Utrecht University the name of William Bosworth Castle appears. According to a wireless message to the *New York Times Boston Herald* he was made a Doctor of Medicine on June 24 on the occasion of the Tercentenary of the University.

Dr. Castle received his M.D. degree from the Harvard Medical School in 1921. He holds the position of Associate Professor of Medicine in the Harvard Medical School and is Associate Director of the Thorndike Memorial Laboratory of the Boston City Hospital. During 1931 he was Director of the Commission of the Rockefeller Foundation for the Study of Anemia in Puerto Rico.

Dr. Castle and his associates have conducted research work concerned especially with the etiology and treatment of pernicious anemia and related macrocytic anemias, including sprue.

#### APPOINTMENTS BY THE HARVARD UNIVERSITY FACULTY

For three years Dr. Robert M. Green, associate professor of applied anatomy, Dr. Charles F. McKhann, associate professor of pediatrics and communicable diseases, Dr. Jacob E. Finesinger, assistant professor of psychiatry, Dr. William G. Lennox, assistant professor of neurology, Dr. Henry R. Viets, associate in neurology, and Dr. Harry C. Solomon, associate professor of psychiatry,

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## THE NEW DIPHTHERIA

AT THE close of the World War, diphtheria appeared in some of the countries of Central Europe in a new and malignant form. The course of the disease was rapid, the symptoms severe and the fatality exceptionally high. Diphtheria antitoxin seemed to have lost its usual efficacy especially in toxic disorders of the nasopharynx, which despite abundant use of antitoxin showed a fatality of 40 per cent or more. Later this more virulent type of the disease appeared sporadically in such great American centers as Chicago, Detroit and New York. Clinicians and bacteriologists were puzzled by the new character which the disease had assumed and believed that the Klebs Loefler bacillus had either undergone a marked transformation in type, or else for some obscure reason the organism had acquired new or exalted toxigenic properties.

Studies of the cultures isolated from fulminating cases and of the toxins produced by the bacilli revealed that the infection was caused by the same familiar diphtheria bacillus and

that the toxin elaborated, because of its neutralization with specific antitoxin, differed in no way from the toxin produced in the past by well known strains of the organism.

The assumption arose that the more rapid and violent course of the diphtheria then prevalent was due to accelerated vital activities of the bacillus and, therefore, the apparent failure of diphtheria antitoxin to mitigate the disease could be ascribed to delay and not to dosage in its administration. Paschau found that doses of antitoxin no greater than 1,000 units per kilogram of body weight were sufficient to prevent the fatality rate from rising from the old levels. When antitoxin was administered to patients in the Berlin Municipal Orphanage and Foster Home, where 80 per cent of the cases received injections within the first two days of the disease, only 1.96 per cent of the patients died, whereas in another children's hospital, in which to only 37.2 per cent of all diphtheria cases and 34.4 per cent of toxic cases was serum administered during the first two days of illness, the percentage of deaths averaged 13.3 per cent.

The answer, then, to the problem presented by the new and more malignant form of diphtheria is not a different antitoxin but antitoxin given as soon as possible after the onset of symptoms. Any case of illness, particularly in children, presenting symptoms which arouse in the physicians' minds a suspicion of diphtheria should, even before a culture is taken for bacteriological diagnosis, be given an intramuscular injection of at least 10,000 units of diphtheria antitoxin. The physician, who always bears in mind that in diphtheria the symptoms observed at any given time represent the delayed effect of the concentration of toxin present in the body twelve to twenty-four hours previously, will appreciate the greater urgency in giving antitoxin if patients stricken with the new diphtheria are to be saved.

## REFERENCE

Berlin letter of March 19 1936 J. A. M. A 106:1674 (May 9) 1936

## THE BILIOUSNESS OF GENIUS

"SICKLED o'er with the pale cast of thought" may be a bit more than a line of poetic imagery, if one follows through the line of reasoning established by T. Wingate Todd, anatomist at Western Reserve University's School of Medicine. According to the philosophical deductions of this investigator, as detailed by the *New York Times*, genius, like an army, travels on its stomach, but what a wagon it has to hitch its star to!

Looking back into history we find that Samuel Johnson's brilliance of imagery and creative thought, as well as his cantankerous disposition were the result of his chronic indigestion.



ficult surgical procedure has revealed the completeness of his self-effacement. He attended the birth of her daughter on the same day that his own child died yet there was no suspicion aroused in her mind of the acute sadness in his

Honors meant nothing to him, usefulness everything. He was nobly born into a family eminent in medicine and public service and was worthy of this heritage. To the humblest of

his helpers he showed as genuine a courtesy as to the richest of his patients. The institutions which he served so faithfully and diligently will continue to owe him large debts. These will be lessened by the tribute of gratitude paid by the great company of men and women whose burdens he lightened and whose lives were touched by his spirit.

R B O

FRANCIS H WILLIAMS M.D.



Dr. Francis H. Williams of Boston, widely known for the important part which he played in introducing and developing the use of the roentgen rays for medical purposes, died on June 22, 1936, at the age of eighty-four years.

He was born in Uxbridge, Mass., April 15, 1852, the son of Henry Willard and Elizabeth (Dewe) Williams. In 1873 he graduated with the degree of B.S. from the Massachusetts Institute of Technology. In 1874 he was a member of the Transit of Venus Expedition to Japan. After his graduation from the Harvard Medical School in 1877 he spent two years

of study in Europe. In 1879 he entered upon the practice of medicine in Boston and almost at once was appointed to the Staff of the Boston City Hospital where most of his important work was accomplished.

Always a pioneer and in advance of others in seeing the possibilities of new methods, Dr. Williams is to be credited with notable achievements apart from the field of the roentgen rays. He was one of the first to test blood pressure using an instrument of his own invention. In the years 1884 to 1891 he gave instruction in therapeutics at the Har-

## OBITUARIES

RICHARD GOODWIN WADSWORTH,  
A B, M D

JUNE 30, 1874-JULY 4, 1936



Photo by Bachrach

Richard Goodwin Wadsworth was a lineal descendant of Peleg Wadsworth, General in the War of Independence, and was born in Boston, the son of Dr Oliver Fairfield Wadsworth, Professor of Ophthalmology at Harvard, and Mary Chapman (Goodwin) Wadsworth. Preparing for Harvard at the Hopkinson School, he received his A B in 1896 and his M D in 1900. He was appointed Surgical House Officer to the Massachusetts General Hospital from 1899 to 1901. On June 25, 1901, he married Mary Heath Atkinson of Brookline and in the same year was made an Assistant Surgeon to Out-Patients at the Brookline Free Hospital for Women. This hospital he served until his death as Surgeon to Out-Patients, Assisting Visiting Surgeon, Resident Pathologist and member of the Consulting Staff. The Harvard Medical School appointed him an Assistant in Anatomy in 1903, a Fellow in Gynecology in 1913, and an Instructor in Gynecology in 1929. He was a Fellow of the American College of Surgeons and of the American Medical Association, a member of the Massachusetts Medical Society, the Boston Obstetrical Society, the Bigelow Club and many other medical organizations. For twenty years he was Secretary-Treasurer of the Boston Medical Library, and for sixteen years the President of the Elizabeth Peabody

House. In the Great War he was medical adviser to the New England Division of the American Red Cross and Chairman of the Committee on First Aid. He had been Secretary of his medical school class since graduation and was elected President for the Tercentenary Year. His clubs were the Tavern, the Tennis and Racquet, and The Country Club of Brookline.

Francesca Alexander has versified an Italian folkloire story called "The Hidden Servants." An humble hermit who has striven hard to be good asks God to show him other living men who have become as holy as he, hoping in his heart that they may prove to be bishops or even cardinals. His prayer is answered but the answer surprises him. The other human beings of equal sanctity are discovered to be several simple folk who hold no religious office. After he has learnt their story and they have shyly told him their deeds, he realizes that the world holds many quiet people who are serving their God and their fellowmen as truly as those in the exalted orders of the Church.

Richard Wadsworth's service was not hidden, the light of his candle was too bright, but he never held the candlestick himself. His sterling worth and great ability were sometimes not fully realized by those who did not come into close contact with his character. An exquisite humility satisfied Saint Paul's description of charity, "which suffereth long and is kind, envieth not, vaunteth not itself, doth not behave itself unseemly, seeketh not her own, is not easily provoked, thinketh no evil." "Charity never faileth," nor did this servant of men and women and medicine fail to fulfil every trust he accepted.

The richness of his nature was revealed to all those who came into contact with him, once his gentle reserve was broken. This was true whether one knew him as a skilful golfing companion or as an intimate in a small medical club, as a member of the staff of a great hospital or as treasurer of the Boston Medical Library and the Boston Health League. The latter organization he had served since its incorporation in 1922 and its balanced budget is due to his financial wisdom. He insisted upon keeping the complicated double entry books himself in order to save expense and these were in complete order at the time of his death.

There was an aura about him of sweetness and strength, of efficiency and skill of unselfishness and courage. His modesty in both speaking and writing may have limited his practice numerically but there was no limit to the confidence he inspired in those who came under his care. He made the poor and those seriously ill his special charges. His surgical results rank with the very best. A patient whose life he has recently saved and made happy by a dif-

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## FUNNEL CHEST\*

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THIS deformity is of absorbing interest because there is no precise opinion upon its origin the causes of its increasing dimensions or the operative method for its cure. As in the case which we report its gradually increasing distortion may totally incapacitate the individual for any sort of work. The condition is thought to be very rare, but in reality this is not so. From our investigations we are led to believe that funnel chest is a fairly common imperfection, that the majority of such patients do not have symptoms, that the advanced form causes a permanent shift of the heart and respiratory tree, that it is often a restraint upon the vital capacity of the young adult, and, because we have found reports of only three operative cases in American literature two of which were traumatic, it is apparent that many individuals believing that nothing can be done for collapse of the sternum, remain crippled.

### CASE REPORT

CASE 1 No 36263 W B a white male seventeen years old who has had funnel chest as long as he can remember was admitted to this hospital March 11 1936 with the complaint of pain in the chest dyspnea, and "stomach trouble." He suffered from these symptoms for years but three months prior to admission they became aggravated to a degree which incapacitated him for work. The pain beneath the sternum radiated to the right shoulder. It was almost constant in the left precordial area. He felt as if a ball were lodged in his stomach causing dysphagia nausea and increasing weakness. Anorexia was pronounced. He sought relief in vain. His best weight was 170 pounds it is now 140 pounds.

Physical examination revealed a tall white male eighteen years old complaining of pain in his chest. The neck showed cervical adenopathy. There was marked depression of the sternum with sharp angulation at the chondrosternal junction especially the lower right portion (figure 1). The heart was displaced to the left with the left border at the posterior axillary line the sounds were of good quality with no murmurs. The lungs showed dullness at the right apex with decreased breath sounds. The abdomen was flat and soft with some tenderness along the right costal margin and in the epigastrium on palpation. The reflexes were normal.

Examination of the blood disclosed 4 530 000 erythrocytes 9 000 leucocytes and 80 per cent hemoglobin. The differential count was as follows:

Read before the Hampshire District Medical Society at Cooley Dickinson Hospital Northampton Massachusetts May 13 1936

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neutrophils 64 per cent, small lymphocytes 32 per cent large lymphocytes 1 per cent eosinophils 3 per cent the nonprotein nitrogen was 38.7 mg and the blood sugar 90 mg. The Kahn test was negative.

X-ray examination March 18 1936 showed the lungs clear. The heart was normal in size and shape but was located owing to marked depression of the lower portion of the sternum entirely to the left of the midline (See figure 2a). The



FIG 1

posterior margin of the sternum was only 3.5 cm from the anterior margin of the eighth and ninth thoracic vertebrae. The lateral projection showed the thoracic spine to be almost straight without the usual upper dorsal kyphosis.

March 28 under avertin anesthesia an operation was done on the anterior chest wall. A double crescent incision was made in a vertical direction over the sternum (See figure 3). We mobilized the sternum by cutting wedge-shaped sections on the proximal side of the costochondral junction and sawing partly through the manubrium in a transverse direction. Two holes were then drilled through the lower third of the sternum about two centimeters apart. Two heavy silver wires were passed into one of these openings and out of the other in order to thread a loop for extension. Traction on the sternum elevated it readily but with it projected the cartilages which had been cut approximately two inches from the sternal border. Here we had the sternum at or nearly at its normal level but the cartilages projected forward about four centimeters. In order to overcome this, another wedge-shaped section was cut entirely through each cartilage at the sternal margin (figure 4) where-

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St. Robert Bellig Library

S. M. S. Medical College

vard Medical School, and some of his teachings as in the use of digitalis were in advance of his time. He was among the first teachers of medicine to introduce bedside instruction to small groups of students. He initiated bacteriological examinations in cases of suspected diphtheria and was the first in the community to use antitoxin in the treatment of that disease. These achievements however, merely illustrate his exceptional ability, which found its great opportunity in this new field of radiology.

In December, 1895, Roentgen, a physicist, announced his discovery of 'a new kind of rays,' without reference to their potential uses in medicine. During the first few months of 1896 Dr. Williams made x-ray pictures in the Rogers Laboratory of Physics of the Massachusetts Institute of Technology, and soon established at the Boston City Hospital an x-ray department which immediately proved its usefulness for medical and surgical examinations. Before the end of 1896 he had examined some forty cases of pulmonary tuberculosis and had demonstrated by means of plates the value of roentgen examinations in various diseases of the heart and lungs. In 1897, using the technique employed by Dr. Walter B. Cannon in laboratory animals, he originated the clinical examinations of the digestive tract by the method followed today. In the field of treatment he was the first to prove, in a case of cancer of the lip, that cancer could be cured by the roentgen rays without destruction of the surrounding tissues. He was very early impressed with the danger to the operator of too long exposure to x-light, and, by means of safeguards which he devised, he alone among the early workers in New England escaped permanent injury or death. In this unknown subject much attention was necessarily devoted to the development of apparatus, in this he was greatly aided by his brother-in-law, William Herbert Rollins, and by fellow workers in electrical science at the Massachusetts Institute of Technology. In 1901 he published his book, 'The Roentgen Rays in Medicine and Surgery,' which stands as a classic in its subject. Throughout the world of radiology it is recognized that to Dr. Williams is due a large share of the credit for the medical applications of Roentgen's discovery.

The discovery of radium opened a new field for investigation which Dr. Williams was one of the first to enter. Here again the X-Ray Department of the Boston City Hospital, which he founded in 1896, and of which he remained the head until his resignation in 1915, became a center for advanced clinical research. The results of thirty years' experience in the use of radium beginning in 1903 are embodied in his book, 'Radium Treatment of Skin Diseases, New Growths, Diseases of the Eyes and Tonsils,' published in 1935.

In personality he was a forceful figure, conspicuous for his zeal for the truth. He was essentially an individual worker preferring to associate with a few close friends of similar tastes rather than with the many. Yet by those whose privilege it was to

know him well, and especially by his younger assistants at the hospital, he was admired and beloved.

He was a Fellow of the American Academy of Arts and Sciences, a Fellow of the Massachusetts Medical Society, the American Medical Association and many other societies both in this country and in Europe. In 1918 he was President of the Association of American Physicians. He was an honorary member of the American Radium Society, American Roentgen Society, and the Radiological Society of North America. Always a loyal alumnus of the Massachusetts Institute of Technology, in 1882 he was elected to life membership in the Corporation, and for the first twenty-five years of its existence was a member of the Executive Committee.

In 1891 Dr. Williams married Anna Dunn Phillips, a granddaughter of the first Mayor of Boston. There were no children.

## RECENT DEATHS

**JOHNSTON**—CHARLES EDWARD JOHNSTON, M.D., of 110 Court Street, Portsmouth, New Hampshire, died in that city June 28, 1936.

Dr. Johnston was born in 1864 and graduated from the Dartmouth Medical School in 1897. He was a former member of the city council, the Portsmouth and State Medical Societies, and the Scottish Clans.

During the World War Dr. Johnston served in the medical corps with the rank of captain.

He is survived by his widow, a brother and three sisters.

**LUNDGREN**—ALBERT GUSTAF LUNDGREN, M.D., of 65 Rosewood Street, Mattapan, died June 28, 1936 at Pocasset.

Dr. Lundgren was born in Worcester, Massachusetts in 1892. He was a graduate of Clark University, and of Boston University School of Medicine (1933). He served as resident physician at the Evans Memorial Hospital in 1934 and 1935 and was a veteran of the World War.

Dr. Lundgren is survived by his widow, Mrs. Vabel Johnson Lundgren, two sons, his mother and four sisters.

**GALLAGHER**—JAMES THOMAS GALLAGHER, M.D., of 20 Monument Square, Charlestown District, Boston, died at his home June 30, 1936.

Dr. Gallagher was eighty-three years of age at the time of his death. He was born in County Sligo, Ireland, and graduated from Trinity College in Dublin.

He came to America in 1892 and studied medicine at the Bellevue Hospital Medical College. After practicing in Salem, Massachusetts for several years, he moved to Charlestown and organized the Charlestown Medical Society.

Dr. Gallagher was a member of the Guild of St. Luke and the Charitable Irish Society of New York.

It is interesting to speculate as to what actually occurred when extension was increased by turning the windlass. We believe that with wet gauze packed around the silver wire the mediastinal space below the sternum had become airtight and elevation of the sternum produced a degree of suction which closed the elastic walls of the esophagus.

X-ray examination of our patient April 18, three weeks after operation showed the sternum descending in an almost straight line parallel with the anterior chest wall. The posterior border of the sternum was now 8.4 cm from the anterior border of the thoracic spine, in contrast to 3.5 cm prior to operation (figure 2).

May 24 two months after operation the patient was discharged from the hospital to return to his



FIG 5

home in Brooklyn. His appearance at this time is shown in figure 6. Upon leaving he declared that breathing was no longer restrained, cardiac action was free of embarrassment and digestion had become normal. Nevertheless we realize that it is too early to determine the ultimate result of this operation.

Up to the present there has been no established surgical procedure for funnel chest. Our quest for a precedent in modern textbooks on surgery before we embarked upon the attempt to relieve this patient failed to disclose any important information. Not until we subsequently searched the literature were we able to find mention of some of the obstacles which we met during operation. For example in severing the ribs near their costochondral junction we did not visualize the obviously unworkable situation with which we were confronted when the sternum was elevated to the normal surface level of the chest wall. As this extension was applied, the rib cartilages projected above the operative field. So they were severed once more, this time close to the sternum. After this step traction on the sternum gave the desired elevation with a much improved alignment of the cartilages to the ribs and sternum.

Owing to the tendency of the body of the ster-

num to sink somewhat as occurred when the silver wires cut through on the twenty-first day of convalescence, probably it would have been wise to obtain maximum extension on the sternum at the time of operation and then fix the apposed ends of the rib cartilages with a single suture of silkworm gut or thread the silver wire around the sternum as did Alexander. A still more satisfactory device would be a steel band which would encircle the body of the sternum at any point and be easily hooked up with the windlass attached to the goal-post. In assuming different positions of the body, our patient was sometimes conscious of an overriding or at least a rubbing, of the ununited fragments of cartilage.

Hemostasis, particularly after the mediastinum is entered, is essential during this operation. Since there is some degree of negative

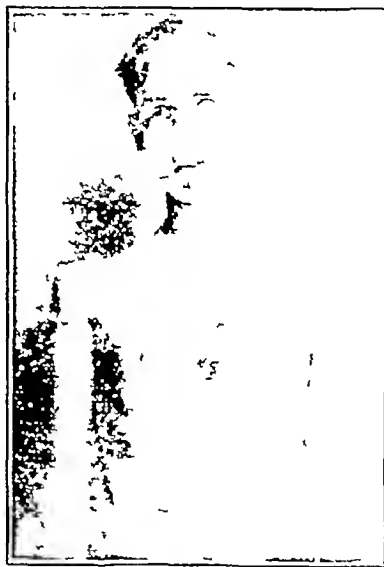


FIG 6

pressure in the space beneath the sternum there exists a tendency for suction to keep severed blood vessels open. The bone marrow of the sternum is rich in capillaries hence bleeding is rather free when the sternum is divided with a saw. In order to facilitate elevation of the sternum control bleeding and thus minimize the postoperative accumulation of blood in the mediastinum we suggest the removal of a wedge-shaped section of the sternum at the junction of the manubrium and body without completely sawing through the posterior bone plate. The sternum will bend easily with traction closing the edges made by the saw thus stopping all bleeding without the need of gauze packing or the use of bone wax.

Another case of congenital funnel chest was observed April 5, 1935 in a boy nine years old who was admitted for treatment of diaphragmatic her-

upon the ribs assumed their normal contour when extension was applied.

In order to maintain the elevation of the sternum already secured, and not having discovered Alexander's<sup>1</sup> description of his operations or any other established operative technique Hyatt constructed

He had vomited greenish fluid and could no longer take anything by mouth. We used an indwelling duodenal tube, feeding him hourly and obtaining some drainage of gastric contents. This treatment irritated the patient and he withdrew the tube. Again he was unable to take anything by mouth.

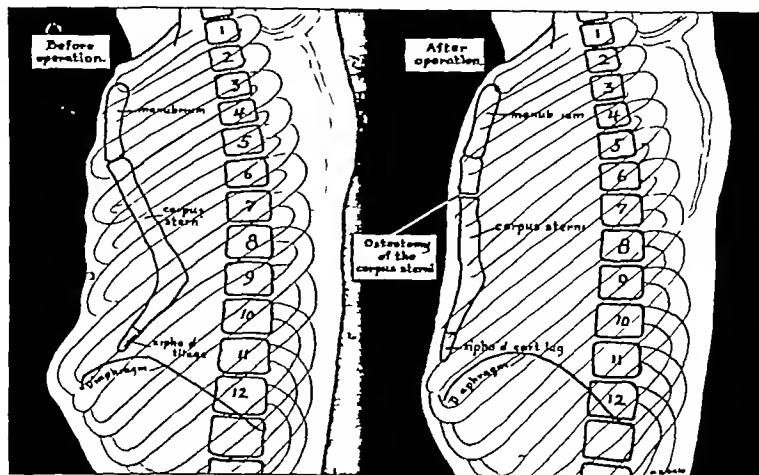


FIG 2a

FIG 2b

a windlass attached to the center of a long bar similar to a miniature goalpost the vertical bars of which were securely embedded in the lateral portion of a plaster cast covering the entire chest and upper abdomen (See figure 5)

His pulse rose to 130 and his temperature to 103°. His condition became alarming. Parenthetically, the surgical resident had noticed that the patient's condition changed soon after the windlass was twisted. Believing that the increased tension might be respon-

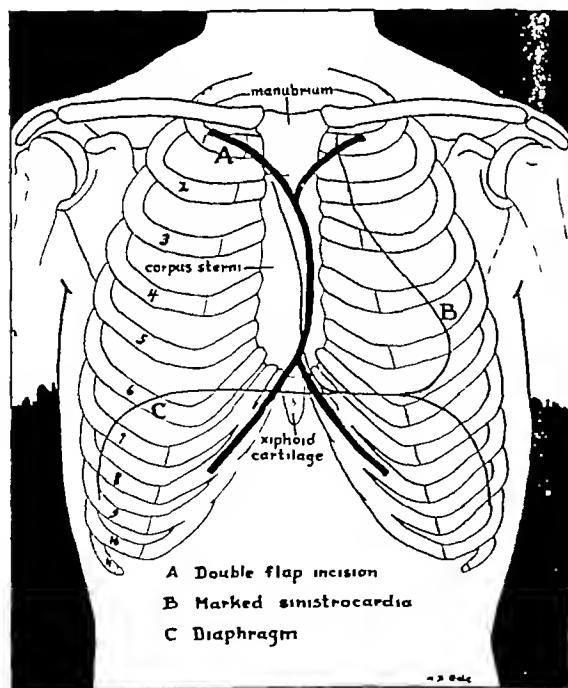


FIG 3

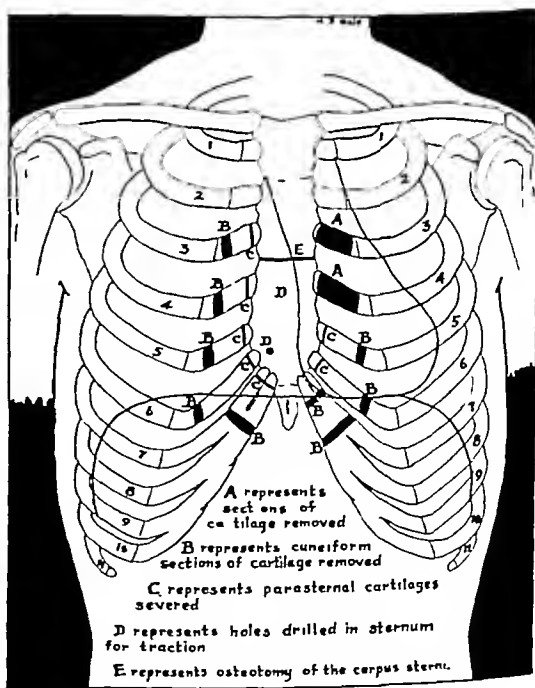


FIG 4

The patient did well during the first forty-eight hours after which time it was thought wise to increase the extension by means of the windlass. A single turn was made and another turn on the following day. On the third day the patient was found to be uncomfortable and his talk incoherent

sible for the bad turn, we released it to a point where extension was less than when originally applied. The situation soon improved. The patient began to swallow liquids, his mental state cleared and the course of his convalescence continued in a normal direction.

the struggle. The continual rapid quivering and grinding have made her extremely nervous and unable to sleep. The chest distress is less if she sits stands or moves about slowly.

In 1930 x-ray examination of the chest showed the funnel shape. The apex of the heart was in the posterior axillary line with a systolic murmur. The organ was held by adhesions as of an old pleurisy or possibly by pericardial adhesions. There was thickening of the pleura in both apices. The lungs showed some markings, but on comparison with earlier x-rays demonstrated no evidence of progression. The diagnosis was lesion of the mitral valve of an old rheumatic type. The heart disability was stated as 25 to 35 per cent of normal sufficient to carry on slightly restricted normal activity.

The consciousness of cardiac activity was ascribed to displacement of the heart and compression by several ribs. The effect on the nervous system was described by the patient as similar to that of the incessant dripping of water. Exercises intended to expand the chest only increased distress.

After a period of complete rest for several months the patient felt that she could breathe more deeply and lift the rib cage high enough for a second or two so as to lose consciousness of cardiac activity. But she is unable to maintain the chest in this position and obtain relief most of the time. Her chest feels weak and tired and droops forward and inward. Any exertion causes soreness in the region of the heart and sleeplessness follows. Sedatives sometimes induce sleep but more often increase her difficulties.

Although the neurotic element in this case is clearly apparent it is both important and difficult to evaluate the rôle of the funnel chest as an etiological factor.

A fourth case was sent to us from the records of the Cooley Dickinson Hospital in Northampton through the courtesy of Dr. R. B. Brigham. The patient was a male sixty years old who gave a history of gradually progressive emaciation with spells of coughing and expectoration of blood streaked yellow sputum for a period of eight years. The lower portion of the sternum showed marked depression. The heart was displaced toward the left.

At the onset of his illness he complained of epigastric pain and was treated medically for duodenal ulcer for a year. This condition improved but the cough, dyspnea, pallor and occasional hemoptysis persisted. On his first admission May 25, 1934, the diagnosis was probable carcinoma of the lung but there was no definite proof of pathology in the chest.

He spent a year at a sanitarium where it was stated he did not have tuberculosis. Symptoms persisted and he showed marked cachexia. On his second admission to the Cooley Dickinson Hospital April 12, 1936, his weight had dropped from 104 to 93 pounds. The sternum was now sunken to such an extent that it seemed almost in contact with the spine. Respirations were rapid, long and very deep. There were coarse bubbling râles at the left base and apex and right base posteriorly. Breath sounds on the left were bronchial in character.

Since sputum examinations for over a year were repeatedly negative and physical signs of a serious lung lesion still present a diagnosis of carcinoma of the lung was made again.

The patient went downhill rapidly and died eighteen days after entry. Permission for a postmortem examination was obtained. The report was as follows:

"The sternum was found to be less than a fingerbreadth away from the vertebral column.

Pleural cavities were free, the lungs negative except for anthracosis and dilated alveoli. The pericardium was negative. The heart was somewhat enlarged because of hypertrophy of the right ventricle. Its walls were equal to those of the left ventricle. The aortic valves were sclerosed. The aorta itself was somewhat dilated and the intima had a cherry-bark appearance. The liver was deformed owing to pressure by the sternum. The abdominal aorta showed marked luteal changes with an aneurysm proximal to the bifurcation and a smaller one on the right common iliac artery. Numerous glomeruli of the kidneys were completely obliterated with sclerosis of the blood vessels and marked infiltration with lymphocytes. The lungs showed only passive congestion. The diagnosis was advanced vascular nephritis. The immediate cause of death was uncertain.

Although the evidence at necropsy in this case revealed lues, arteriosclerosis, aneurysm and nephritis, the immediate cause of death in the opinion of the examiner remained clouded. And to what degree the funnel chest may be considered a contributory factor is difficult to determine. Epigastric pain, cough, attacks of dyspnea, hemoptysis and loss of weight at first suggested peptic ulcer. Later this diagnosis was shifted to pulmonary tuberculosis on account of which he remained in a sanitarium for a year. Finally in the absence of positive evidence of tuberculosis of the lungs the diagnosis was changed to cancer of the lungs.

At autopsy there was found no pathological evidence of any one of these diseases. It is clear that the funnel chest had resulted in a progressive dysfunction of the circulatory mechanism and produced a clinical picture both unusual and confusing.

#### HISTORY

Since the first reference to funnel chest made by Bauhinus<sup>3</sup> in the sixteenth century few cases were reported prior to 1900. In 1860 the condition was described by Rokitsky<sup>4</sup> who took his patient Wojaczek, a medical student in Vienna on tour as a curiosity. The pathological institute at Göttingen contains a plaster cast of Wojaczek's chest demonstrating the enormous depression.

In 1900 Picque and Colomban<sup>5</sup> measured the capacity of the depression in various individuals and found that they held from 50 to 170 cc of water. Since 1900 mention of the deformity is more frequent. By 1909 Epstein of Leipzig<sup>6</sup> had compiled ninety-seven cases, all medical.

The first operation for funnel chest was by Ludwig Meyer in 1911. The patient was a sixteen-year-old boy who had a funnel chest from birth. When first seen by Meyer this depression was five centimeters in depth. It caused dyspnea of such severity that the boy was in great discomfort. There was also present a tuberculous infiltration of the upper lobe of both lungs.

Since the operation had never been done Meyer consulted a fellow surgeon, Freund, who advised resecting two or three costal cartilages. Meyer therefore limited his resection to about



nia The appearance of the chest is seen in figure 7 The patient was the fourth child, breech delivery He was always finicky about nursing and often had spells of cyanosis and dyspnea The diaphragmatic hernia was discovered by x-ray examination when the child was thirteen months old

The depression over the sternum became more marked as age advanced Contrary to the usual findings in funnel chest the heart was displaced to the right owing to compression from the viscera in the left chest. There was a violent cardiac impulse seen to the right of the sternum in the fourth space and a loud precordial systolic murmur The

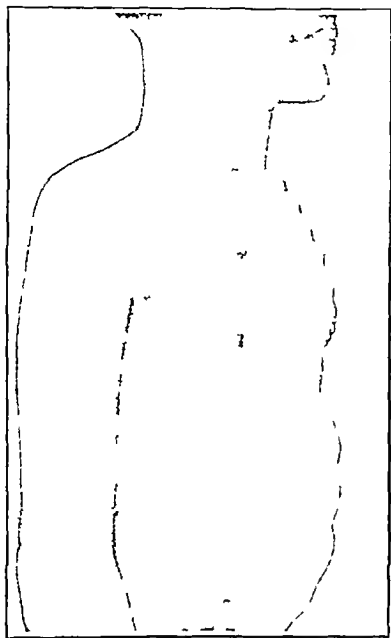


FIG 7

entire right chest was hyperresonant The left chest was flat over the lower half with diminished breath and voice sounds

The child was slender, pale, very nervous and manifested choreiform motions The blood pressure was as follows left arm 90/50, right arm 80/30 left knee 120/40 right knee 120/50

Previous illnesses include measles diphtheria scarlet fever chickenpox, rheumatic fever and pneumonia

An electrocardiogram was obtained April 10 1936 No arrhythmia was noted The P wave was normal There was a deep Q wave in leads I and II (7 mm in lead I, 6 mm in lead II and only 3 mm in lead III) The T wave was of the peaked type The ST interval was normal and the chest leads within normal limits The impression was simple tachycardia with deep Q waves of uncertain significance

Since the case was complicated by an extensive diaphragmatic hernia it was impossible to define the effect of the functional capacity of the heart Edelken and Wolferth<sup>2</sup> explained the lack of cardiac symptoms in funnel chests of moderate and severe grades by assuming a gradual adjustment of the heart as a result of slow development of the condition Symptoms were more prone to occur in cases of trauma or in those complicated by lung lesions

This boy was operated upon April 13 1935 under gas-oxygen positive pressure anesthesia for reduc-

tion and repair of the diaphragmatic hernia His breathing was irregular and when ether was given to secure relaxation during the stage of reduction it had to be discontinued on account of his condition The patient died on the third postoperative day Our pathologist reported death due to asphyxia

At postmortem examination the concavity made by a depressed sternum was found to be 10 cm in width and 6 cm in depth This depression was more to the left of the midline the ensiform cartilage 3 cm to the left The sternum, with the convexity downward reached a level which was only 3.5 cm from the vertebral column The heart was entirely on the right side with a considerable degree of torsion on the great vessels The right ventricle showed hypertrophy undoubtedly due to pulmonary resistance

A third patient is a woman whom we have not seen She is thirty-nine years old and unmarried She has included us among many surgeons with whom she has corresponded As she writes her symptoms are presented in such lurid detail that we consider the statements cited below a fair presentation of the symptoms resulting from funnel chest

O. G. C. was first heard from April 14, 1935 The cause of the chest deformity and date of its first appearance are uncertain It may have been acquired gradually or have resulted from an accident twenty-one years previously The depressed sternum was not observed until three years subsequent to the accident Upon consulting a physician it was discovered that the heart was displaced to the left Tonsillectomy was done at this time

Shortly afterwards in December 1918 she con-



FIG 8

tracted influenza followed by pneumonia and empyema For the latter condition two operations were done one in February, 1919 and the second in May, 1922 thereafter the depth of the depression of the sternum showed an appreciable increase At present it is as shown in figure 8

Since 1918 the patient has been troubled with thoracic distress The cardiac activity has been an insistent factor in her consciousness especially when she lies down The patient feels forced to help the heart action along with conscious effort Thus a tug of war seems to be going on between her heart and mind and the latter gets very tired of

prior to operation. The lassoing band and wire were removed on the thirty-fifth postoperative day. A tendency to recurrence disappeared after a course with blow bottles and a suction apparatus connected with the hospital air suction system.

Alexander's second case was that of a woman twenty years old, injured two years previously in an auto accident. The body of the sternum was removed from the second to the sixth rib with resection of the attached costal cartilages (as in figure 10). The resulting skeletal defect measured 9 x 6 cm. The first operation was more extensive. Since the patient was a male

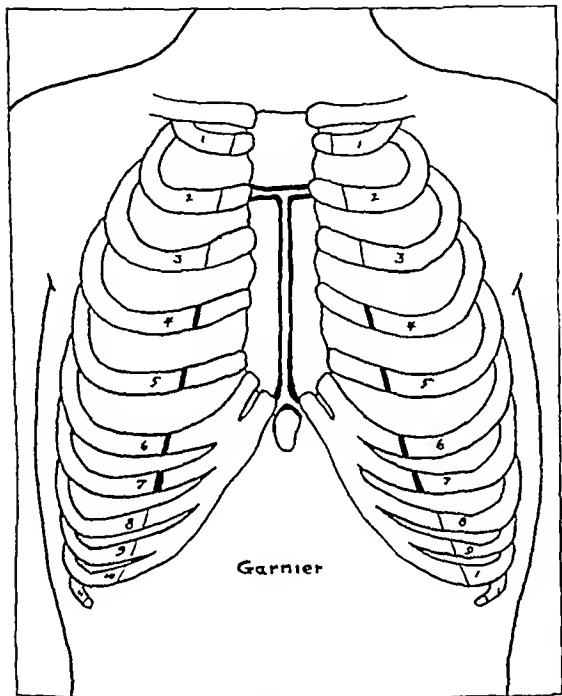


FIG. 11

sufficient cartilage was left to protect the mediastinum.

When these operations were done, Alexander knew of no previously devised technique for this deformity. In 1933 Carr<sup>2</sup> of Chicago reported a case in an unmarried female nineteen years old who was operated upon by Head. He removed the left third, fourth, fifth, sixth, and seventh costal cartilages and the right fourth, fifth, sixth and seventh, and resected the lower half of the sternum and the xiphoid process. Carr refers to another case in a boy thirteen years old whose parents had not consented to operation. When a second operative case of Head's ended fatally, Carr was not sure he wished to submit the boy to surgery.

Garnier<sup>12</sup> divides three or four costal cartilages bilaterally and resects the body of the sternum by a T-shaped incision. (See figure

11.) Often the operation is done in two stages to minimize the risk of shock. Ombredanne sometimes resects six or seven costal cartilages unilaterally. A metal vise or pince is placed around the sternum to which cords or wires are attached and suspended from a box placed on the chest for traction.

Operations done for funnel chest in the last decade prove that it is possible to enlarge the thoracic cage anteriorly and free the organs from pressure in cases of congenital and traumatic funnel chest in the child, the adolescent and the adult. Garnier collected twenty-two cases operated upon since Meyer's attempt with four deaths, a mortality of 18 per cent. Zahradnick's case and two others mentioned by Carr were the only other surgical cases found.

As to age there were nine children with one death, thirteen between the ages of sixteen and twenty with two deaths, and one case in a female twenty-seven years old which ended fatally.

#### SUMMARY

Four cases of funnel chest are reported. Three of these were congenital, one was traumatic. One of the congenital cases was treated surgically. The operation described was undertaken on textbook authority which advocated surgery but offered no method of procedure.

Subsequent research revealed two traumatic cases operated upon by Alexander who employed an original and ingenious technique. Another case was treated surgically by Head; these furnish the only suggestions from surgeons in this country.

Cases of this disfigurement are not uncommon. A relatively small number of patients suffer from serious cardiac and respiratory embarrassment; they are sufficiently numerous, however, to demand surgical treatment and offer a stimulus to further study and effort.

The frequency of tuberculosis as an intercurrent disease warrants a collective operation in early childhood.

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2½ cm of the third and fifth cartilages on the right side. Dyspnea ceased on the second post-operative day, but the end-result was not satisfactory. Meyer made the following prophecy:

I do not champion Freund's operation for all cases but I believe the time is not far distant when this operation will be far more widely employed in all cases of malformations of the thorax or spinal column to facilitate normal respiration.

Two years later Sauerbruch<sup>6</sup> operated upon a man eighteen years old. He resected far more extensively removing the left costal cartilages and portions of the sixth to the ninth ribs and the attached portion of the sternum. Symptoms disappeared and did not recur. Sauerbruch repeated this operation in 1931.

Zahradníček<sup>9</sup> in 1925 and Hoffmeister<sup>10</sup> in 1927 operated upon young men for funnel chest. These courageous attempts, however remained ignored by many writers. Fischer<sup>11</sup> in a study of congenital malformations of the thorax in 1928 stated:

"On a essayé par des manoeuvres respiratoires variées de remédier à ce vice congénital, jusqu'à présent les moyens employés ne semblent pas avoir produit de résultats appréciables: c'est donc une défectuosité somatique que l'on doit conserver."

In substance, no palliative measures had provided a remedy for the relief of symptoms. From 1925 to 1930 Ombredanne<sup>12</sup> at the Surgery for Children in Paris studied the surgical needs for this complaint in the young. In 1931 he joined Garnier<sup>13</sup> and adopted an operation which was fairly well standardized by 1934. This was a T-shaped sternotomy to elevate the costal arch with resection of the cartilages as required followed by immobilization by a special orthopedic apparatus.

Results in nine cases appeared in 1934. Other surgeons operating on funnel chests were Martin of Paris, Perrot of Geneva (two cases, one fatal), Richard and Dupuis (two cases). In his second case (1931) Sauerbruch used a traction-apparatus similar to a Bradford frame. Mathieu (1933) presented before the French Congress of Surgeons a young girl treated by the same technique with elastic traction on the sternum. He repeated the operation successfully on two other young patients.

All these cases were congenital. Two rare cases of the traumatic type were reported by Alexander<sup>1</sup> of Michigan. He used a T-shaped sternotomy with chondrosternal resection conceiving the idea independently of Ombredanne. His first patient was a boy sixteen years old injured four years previously while wrestling. Even after bilateral resection of five costal cartilages the sternum could not be elevated, and only after longitudinal division of the sternum could the bony structure be lifted forward

(See figure 9). A Parham fracture band and silver wire were passed beneath the sternum, piercing the mesial ends of the fifth and sixth

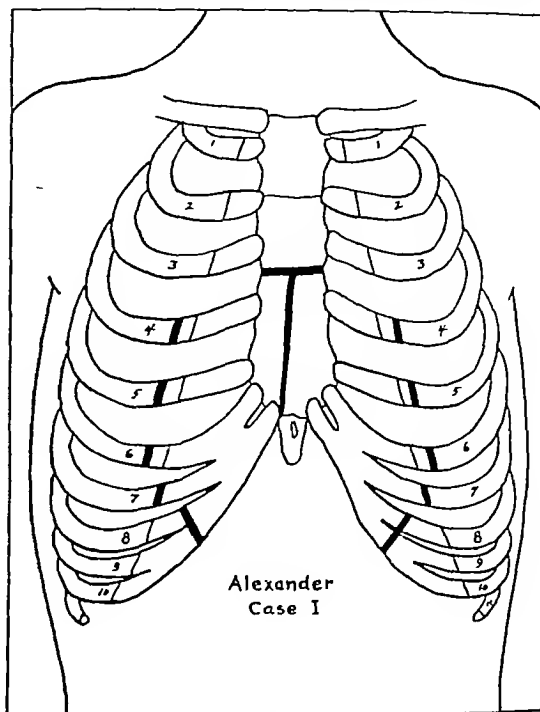


FIG 9

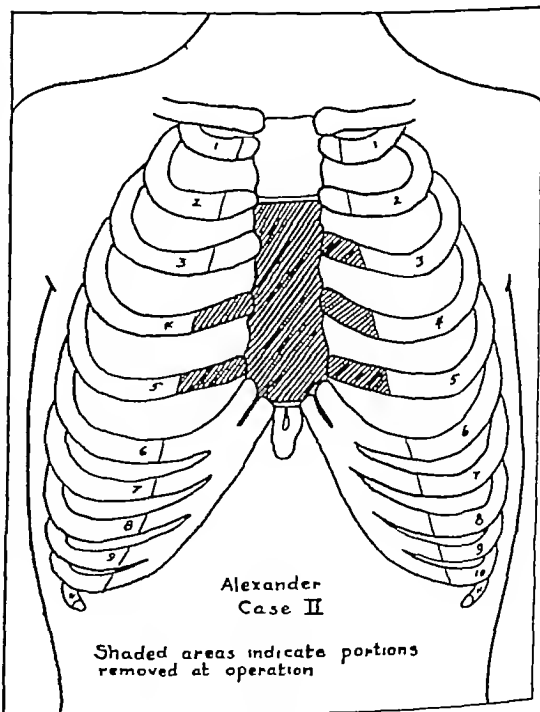


FIG 10

intercostal spaces. These were then attached to heavy rubber bands suspended from a bar on a special apparatus fitted on the patient

equal distribution between the thirty to forty and the forty to fifty periods. There is a progressive increase with each decade up to the fourth and a progressive decrease after the fifth. The values shown for the sixth, seventh and eighth decades are somewhat atypical due to the hospital's policy of referring patients over fifty-four years of age to other institutions.

It is of interest to note that seventy-one of the patients were less than twenty-five years of age. Of these seventy-one all but fourteen were congenital cases. The youngest patient with acquired dementia paralytica was twenty-two years old. In practically all of the fourteen cases of acquired dementia paralytica below twenty-five years of age it was impossible to determine the exact date of the primary infection, but

THE AGE DISTRIBUTION OF 2238 CASES OF  
DEMENTIA PARALYTICA

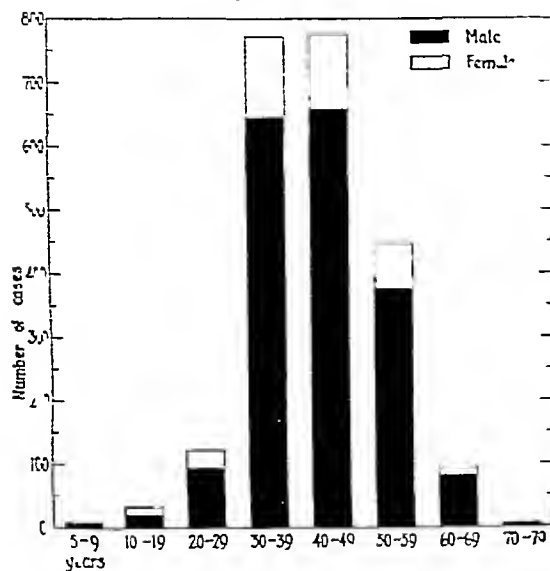


FIGURE 2

one patient who was twenty-three years old was known to have had his primary infection three years prior to the onset of the psychosis.

#### THE CIVIL STATUS

The civil status was determined in 2231 of the patients as shown in table 1. The figures in this table do not indicate any special abnor-

TABLE 1  
THE CIVIL STATUS OF 2231 PATIENTS WITH  
DEMENTIA PARALYTICA

Civil Status	Male	Female	Total	%
Single	541	75	616	27
Married	1198	219	1417	64
Divorced	33	11	44	2
Separated	12	3	15	1
Widowed	89	50	139	6
Total	1873	358	2231	100

mality in the civil status of patients with dementia paralytica. This is in striking contrast however to similar figures based on cases of dementia praecox or epilepsy. This can be readily understood since dementia paralytica is the result of an acquired infection and the psychotic symptoms do not become manifest until a good many years after the commoner ages for marrying.

#### THE RELIGIOUS STATUS

The religion professed by the patients was ascertained in 2194 of the 2274 patients with dementia paralytica as shown in table 2.

TABLE 2  
THE RELIGIOUS STATUS OF 2194 PATIENTS WITH  
DEMENTIA PARALYTICA

Denomination	Male	Female	Total	%
Roman Catholic	869	187	1056	49
Protestant (all groups)	783	150	933	42
Jewish	141	15	156	7
Greek Orthodox	37	0	37	2
Others	12	0	12	—
Total	1842	352	2194	100

The figures in table 2 show that approximately half the patients with dementia paralytica were Roman Catholics and an almost equal number were of the Protestant faiths. Seven per cent were Jewish. These figures are not considered remarkable by themselves but are regarded mainly as representative of the religious division among the local population.

#### THE OCCUPATIONAL STATUS

The former occupation was determined in practically every case studied. An analysis of the various occupational groups is not presented in this study because the patients admitted to the Boston Psychopathic Hospital with few exceptions are for obvious reasons drawn from the marginal or dependent social groups.

#### SUMMARY

In the study of 2274 patients with dementia paralytica admitted to the Boston Psychopathic Hospital between 1913 and 1934 inclusive the following facts were determined:

- (1) Approximately 100 patients with dementia paralytica were admitted annually.
- (2) This number constitutes about 8 per cent of the annual first admissions of patients "with psychosis."
- (3) When these cases were grouped according to five-year periods a slight progressive decrease was noted in the two periods from 1924 to 1933.
- (4) The ratio of males to females was as five is to one.

## DEMENTIA PARALYTICA AT THE BOSTON PSYCHOPATHIC HOSPITAL\*

### A Survey of 2274 Cases

BY MERRILL MOORE, M.D.,† AND H. HOUSTON MERRITT, M.D.†

#### INTRODUCTION

**I**N an earlier study the authors estimated that syphilis of the nervous system was the cause of mental disease in approximately 93 per cent of the patients admitted to the Boston Psychopathic Hospital during a period extending from 1912 to 1934. Furthermore it was found that patients with dementia paralytica constituted 91.2 per cent of the cases with mental disease due to syphilis. It is the purpose of this article to present further studies on this series (2274) of patients with dementia paralytica.

#### THE YEARLY INCIDENCE OF DEMENTIA PARALYTICA

The yearly incidence of dementia paralytica from 1913 to 1934 inclusive is shown in figure 1.

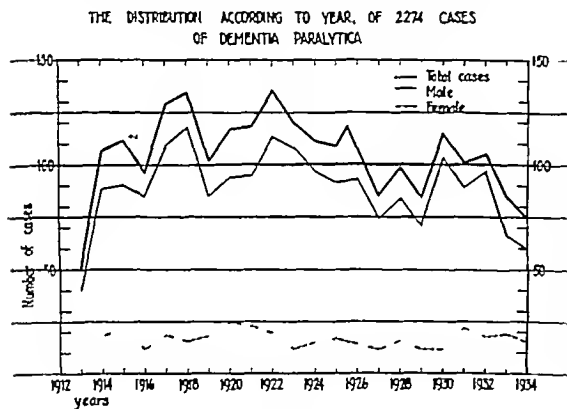


FIGURE 1

As indicated in this figure, approximately 100 patients with dementia paralytica were admitted each year. There were several outstanding exceptions namely 1917, 1918 and 1922 when respectively 128, 133 and 133 patients were admitted and 1913 and 1934 when only 50 and 60 patients respectively were admitted.

When figure 1 is simplified to indicate the admissions for four five-year periods (1914 to 1933 inclusive) one sees very little difference in the four periods. There is, however, a slight decrease in the number of patients with dementia paralytica in the last two five-year periods as shown below:

1914-1918	488 males	57 females	575 total
1919-1923	493	97	590
1924-1928	438	74	512
1929-1933	406	51	487

From the Department of Diseases of the Nervous System of the Harvard Medical School, the Boston Psychopathic Hospital and the Neurological Unit of the Boston City Hospital.

\*Moore—Merrill—Associate in Psychiatry, Harvard University Medical School. Merritt—H. Houston—Associate in Neurology, Harvard University Medical School. For records and addresses of authors see *This Week's Issue*, page 131.

The occurrence of this apparent decrease brings up two questions. Does it indicate a biological change in the nature of syphilis and if so is this change due to modern methods of diagnosis and treatment? Neither of these questions can be answered from the data of this series of cases. Other investigators have not found such a decrease. Hadden<sup>2</sup> for example, found a 54.9 per cent increase in the five year period 1924-1929 over a similar period from 1914 to 1919. A possible explanation of the apparent decrease in the number of patients with dementia paralytica admitted to the Boston Psychopathic Hospital in the past decade may be made by reference to the fact that the growing use of lumbar puncture and examination of the cerebrospinal fluid, have led to earlier diagnosis and treatment by trypanamide or fever therapy in the general hospitals of this community.

#### THE SEX DISTRIBUTION

A comparison of male and female patients with dementia paralytica is shown in figure 1. With rare exceptions the males constituted between 80 per cent and 90 per cent (averaging 84 per cent) and the females between 10 per cent and 20 per cent (averaging 16 per cent). This gives a ratio of males to females of 5.2 to 1. This ratio is of special significance when compared with the sex distribution among all first admissions where the ratio is only 7 to 6 in favor of males. The overwhelming predominance of the male sex in cases of dementia paralytica has been noted by all investigators.<sup>3</sup> The cause is, however, still obscure since the probable ratio of primary syphilitic infection among the sexes is not greater than 2 to 1 in favor of males. It has been postulated by Moore<sup>4</sup> that the explanation lies in the fact that some biological immunity may be conferred on female patients as the result of pregnancies. Some support to this hypothesis is offered by the studies of Wile<sup>5</sup> and his co-workers who found that the excess of males over females was much less when the dementia paralytica develops at an early age that is before the child bearing period. The figures of this series support Wile's findings but to a lesser degree.

#### THE AGE DISTRIBUTION

The age distribution of the 2274 patients with dementia paralytica is shown in figure 2. It is a very striking fact that the great majority of the patients were found in the two decades between thirty and fifty with nearly

formula and the disposition of the milk. No changes in the formula were made without permission of the doctor conducting the study. Each mother kept a diary in which she recorded the exact amount of the formula ingested by the infant at each feeding thereby making it possible to determine the number of vitamin D units taken each day through the period of study.

The formulae consisted of whole milk, corn syrup and water and were altered only during infections or when it became necessary to increase the amounts on account of the increasing requirements of the babies. Antiscorbutic substances in the form of orange or tomato juice were added to the diet at appropriate periods as were cooked cereals and strained vegetables. Thus the diet met all of the known nutritional mineral and vitamin requirements with the exception of vitamin D which was supplied solely from the milk. In view of the fact that the greater part of this study was con-

ducted at a time when the weather was of such a nature as to preclude sunbaths, and at a time when there was very little if any antirachitic value in the sun rays, one seems justified in assuming that the only protection against the development of rickets would of necessity have to be supplied by the milk.

The results of this study showed that none of the infants developed rickets either by clinical or roentgen-ray examination, regardless of which milk they received. In the majority of instances the rate of growth was within the accepted curve of normal growth and development. In view of these observations it would appear that both the irradiated vitamin D milk and the yeast-fed vitamin D milk were adequate as *prophylactic measures*. Although much has been said in favor of the milk containing the higher vitamin D content, yet the actual necessity of a milk containing this high content (when employed as a *prophylactic measure*) has not been satisfactorily established.

TABLE 1

AGE OF INFANTS AT BEGINNING OF STUDY

	Number of Infants	
	Yeast Milk	Irradiated Milk
From 2 days to 4 weeks	2	4
Over 4 weeks and under 6 weeks	1	2
6	1	1
8	4	2
10	1	0
12	1	1
14	3	1
16	1	1

TABLE 3

AVERAGE MONTHLY GAIN IN WEIGHT AND LENGTH\*

Age in Weeks at Second and Subsequent Examinations	Yeast Milk		Irradiated Milk	
	No. of Infants	Average Monthly Growth in Weight and Length	No. of Infants	Average Monthly Growth in Weight and Length
1-6 weeks	0		2	737 gm 16 cm
7-10	3	496 gm 22 cm	7	728 30
11-14	6	602 26	9	772 34
15-18	10	578 29	11	544 23
19-22	12	663 23	11	532 19
23-26	11	417 17	8	622 16
27-30	9	357 14	4	418 14
31-34	4	581 06	3	392 12
34-37	0		1	687 10

\*Approximate 4 week periods. At each of these intervals the patients received a physical examination and a roentgenological examination of the forearm.

TABLE 2

AMOUNT OF MILK\* REPORTED TO HAVE BEEN TAKEN DAILY DURING SPECIFIED AGE PERIODS

Age Periods	Yeast Milk		Irradiated Milk	
	Average	Range	Average	Range
1-6 weeks	17 oz	16-18 oz	16 oz	13-20 oz
7-10	18	15-20	18	13-23
11-14	21	16-27	20	16-23
15-18	23	21-29	24	20-28
19-22	26	21-30	25	21-29
23-26	25	20-32	26	22-30
27-30	28	20-32	26	23-29
31-34	27	23-32	24	22-26

\*These figures represent the actual amounts of milk ingested exclusive of the water and corn syrup contained in the formula.

TABLE 4

AVERAGE NUMBER OF U.S.P. UNITS OF VITAMIN D TAKEN DAILY\*

Age in Weeks at Second and Subsequent Examinations	Yeast Milk		Irradiated Milk	
	No. of Infants	Average Number of U.S.P. Units of Vitamin D	No. of Infants	Average Number of U.S.P. Units of Vitamin D
1-6 weeks	2	226	6	66
7-10	6	237	9	74
11-14	9	290	11	86
15-18	11	315	12	100
19-22	12	349	11	107
23-26	11	342	8	111
27-30	9	351	4	111
31-34	4	359	3	102

Yeast milk contained at least 43\* U.S.P. units per quart; irradiated milk contained at least 135 U.S.P. units per quart as shown by repeated biological assays examinations at the Massachusetts Institute of Technology.

(5) The youngest patient, exclusive of the congenital cases, was twenty-two years and the oldest was seventy-nine years old. Over two-thirds of the patients were between the ages of thirty and fifty.

(6) A study of the civil status showed that approximately two-thirds of the total number had been married and one-third were single.

(7) The religious denominations to which these patients belonged were Roman Catholic, 49 per cent, Protestant, 42 per cent, Jewish, 7 per cent, Greek Orthodox 2 per cent.

#### CONCLUSIONS

The above facts are stated in support of the following conclusions:

Dementia paralytica is the cause of the psychosis in 8 per cent of first admissions to a state hospital for mental disease and there has been no significant change in the incidence of dementia paralytica in the last twenty years. Dementia paralytica occurs among patients of

the male sex more than five times as often as in the female sex. The cause of this is not clear but it indicates that the female sex may have some immunological resistance to the development of dementia paralytica. Dementia paralytica is a disease of early middle life. The cause of this is obvious since the primary syphilitic infection usually is acquired in the early years of sexual activity and the tertiary symptoms of dementia paralytica usually become manifest five to twenty years later.

The authors wish to thank Dr. H. C. Solomon, Chief of the Division of Therapeutic Research of the Boston Psychopathic Hospital, for help and material he has given them in the preparation of this Survey.

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## THE PROPHYLACTIC VALUE OF VITAMIN D IRRADIATED AND VITAMIN D YEAST-FED MILK\*

BY R. CANNON ELEY, M.D.,† E. C. VOGT, M.D.,‡ AND MARY G. HENDERSON, R.N.‡

**T**HIS study was undertaken in an effort to determine the relative prophylactic values of two types of vitamin D milk when it was employed as the only source of antirachitic substances in artificially fed infants, i.e., it was a "preventive" and not a "curative" study.

During the period of observation, which began in January, 1935 and extended through May, 1935, twenty-six infants were studied†. All infants were placed on vitamin D milk within the same week and therefore it was possible to follow the entire group for a period of five months. The age incidence of the patients at the beginning of the study varied from two weeks to twelve weeks. With the exception of three infants who had received one drachm of plain cod liver oil daily for four weeks, and three infants who had received a similar amount at irregular intervals for from two to three weeks, none of the infants had received any antirachitic substance. Ten were girls and sixteen were boys. The group contained one set of twins and three premature infants.

The infants were secured through the cooperation of the Brookline Friendly Society and were subjected to a physical examination at that

clinic once each month. On each examination measurements of the fontanel, head and chest circumference, length and weight determinations were noted. Notes were also made in regard to dentition, muscular development and activity of the baby. In view of the fact that slight rachitic changes are not always detectable by physical examination, roentgenograms of both forearms were taken by a uniform technique at the Children's Hospital of Boston once each month and compared with the results of the physical examination. Such a procedure also made it possible to institute corrective measures at an early date should rachitic changes develop. Chemical determinations of serum phosphorus and calcium were not made as one of the purposes of this study was to utilize only those procedures which were readily available to any practicing physician.

In order to maintain a standard potency of the milk biological assays were made at regular intervals. The milk, which was delivered free to each family every morning, contained 135 U. S. P. and 432 U. S. P. vitamin D units, the former being obtained by irradiation and the latter by feeding the cattle known quantities of yeast. Thirteen infants received the irradiated and fourteen the yeast milk.

As an added precaution against possible errors occurring within the homes, the same nurse who assisted at the time of the physical examinations made weekly visits to the home of each patient at which time comprehensive notes were made regarding infections, preparation of the

\*The expenses of this study were defrayed by the Wisconsin Alumni Research Foundation.

†Two infants were omitted in the final analysis as the figures were not dependable.

‡Eley, R. Cannon—Associate in Pediatrics and Communicable Diseases, Harvard University Medical School and School of Public Health. Vogt, E. C.—Instructor in Roentgenology, Harvard University Medical School. Henderson, Mary G.—In charge of Child Welfare, Brookline Friendly Society. For records and addresses of authors see "This Week's Issue," page 131.



Upon palpation of the urethra through the penis the typical "beaded" areas throughout the whole course of the anterior urethra will be felt. A persistent and spreading ulceration at the urinary meatus with exclusion of a chancre in the diagnosis will make one suspect a tuberculous infection in the epididymis or the seminal vesicles. Rarely are the kidneys infected when the urethra is involved. Night sweats have been observed and a gradually increasing weakness with loss of weight will also be noted. This may be rapid if there is a millary involvement of the lungs. Terminal hematuria has been mentioned by Hinman this occurring only when the ulcerated stage was present. Hinman states that the symptoms will be present only when the stage of ulceration has occurred. There will then be pain and burning during and after urination. The symptoms are the same whether the infection is in the anterior or posterior urethra. It is best to avoid instrumentation in the diagnosis of urethral infection for if there is any traumatism the will be an extension of the infection to other organs. If the lungs have not been infected there is a possibility of a millary infection being initiated by the trauma of the passage of a sound catheter or cystoscope or a general infection through the blood stream.

Little can be found in the literature about the treatment of tuberculosis of the urethra especially where there has been an involvement of the lungs. As to the ulceration of the glans penis two cases have been reported by Keves one cured by cautery and the other by x-ray but without evidence of involvement of the urethra. Surgical removal of the penis and all of the affected genital organs as advocated by Young and also by Lazarus in his treatment of the primary infection would seem to be the most effective treatment.

A report of a case of tuberculosis of the urethra is herewith presented.

C. E. B. a married white male machinist aged fifty-eight was admitted to the Springfield Hospital July 23, 1935 complaining of a purulent discharge from the penis with extreme pain and burning on urination. Examination revealed an ulceration of the penis. The patient's family history was irrelevant. In 1931 he claimed to have received a blow on his scrotum. There was no swelling of the testicle at that time but the pain in the scrotum was very severe and lasted about one week. In 1932 while at work and exerting much force in using a wrench he experienced another attack of pain in the right scrotum. Upon lying down for a while the pain ceased. He does not think that the testicle was swollen at the time. In August 1933 he had a recurrence of the same trouble while at work. The pain ceased when he engaged in lighter work. In January 1934 he resumed his previous strenuous work with the result that the pain recurred in the right testicle and in addition his right scrotum was swollen which at that time was diagnosed as a traumatic hydrocele. This condition persisted for some time and in the

early part of 1934 at another hospital the right testicle was removed. It was found to be tuberculous. From that time until his admission to the Springfield Hospital he had frequency and extreme burning on urination. About three months previous to admission to the hospital a doctor passed a sound, after which there was increased pain and burning during urination and also bleeding from the urethra. Following this he had bladder irrigations after which he suffered from intense burning in his penis with frequency of urination. At about this time he noticed a whitish discharge from his urethra. He denied having had chills or fever. He noticed a sore on his penis about three weeks before coming to the hospital. He stated that he had lost twenty pounds in the last four months and denied having had any night sweats until the last two weeks. About one month ago he noticed a dry unproductive cough. About the same time he noticed that the end of his penis was very sore if anything came in contact with it.

Examination showed a small underweight man not confined to bed. He did not appear to be very ill and made no complaints other than pain on voiding. His weight was about 100 pounds. His head, neck and eye examinations were normal, his pupils reacting to light and accommodation.

The heart was negative. Blood pressure was 112/70.

The lungs showed fine crepitant rales over both apices especially over the right.

The abdomen was negative.

The kidneys were not palpable or tender upon deep palpation. The Murphy sign was negative over both costovertebral areas.

The penis showed a crescentic ulceration on either side and beneath the meatus being symmetrical and having a yellowish base. There was no exudate from these but they were tender to the touch. Size of ulceration was 2 mm x 1 mm. The edges of the ulcer were slightly indurated. There was evidence of narrowing of the meatus. Upon palpating the underside of the penis, hardened indurated areas were felt along the shaft from the penoscrotal junction to the meatus with slight tenderness. There was a scanty, thick, yellowish, purulent discharge at the meatus.

The right testicle was absent, the left testicle and epididymis presented no enlargement or areas of induration and were not tender to palpation. The prostate by rectal examination was small and very hard, the lower tip of the right seminal vesicle was hard and indurated.

The reflexes were normal.

Repeated examinations of the pus from the meatus showed no gonococci or acid fast bacilli. The blood Hinton was negative.

After repeated examinations of centrifuged specimens of urine, acid fast bacilli were found one week after he had been in the hospital. He had many white blood cells and a few red blood cells in the sediment and many cocci.

The temperature varied from 98.100° daily and the pulse rate was 80-90 and respirations were 20.

The blood count showed 7750 W. B. C. 4010000 R. B. C. and Hb 65 per cent.

The differential count and blood smear were negative.

On August 5, 1935 the x-ray report of the chest examination showed flocculent shadows throughout the left lung and a greater amount of density in the right apex with finer millary shadows throughout the right lung. Diagnosis: Pulmonary tuberculosis.

## TUBERCULOSIS OF THE URETHRA, WITH REPORT OF A CASE

BY IRA N. KILBURN, M.D.\*

**T**UBERCULOSIS of the urethra is a condition rarely seen and reports in the literature of such cases have been very meager in the past. Chute cites in Hinman's Urology, that Pautel reporting on 1455 autopsies found 380 to have tuberculosis of the urogenital organs, and that seven of these, or approximately 1.75 per cent, had tuberculosis of the urethra. Chute believes that these cases are rare where the urethral lesions are prominent, citing one case where the signs and symptoms pointed to the anterior urethra but there was a silent tuberculosis of the rest of the urogenital tract. Pelouze claims that such a condition is not uncommon, and that these cases will have a chronic urethral discharge. Barney states that primary tuberculosis of the urethra is rare, but when the urethra is affected, there will be found evidence of tuberculosis elsewhere in the body. Von Bergmann's Surgeon states that this condition is rare but when present, it is combined with tuberculosis elsewhere in the urogenital tract, or there is a generalized tuberculous infection.

Tuberculosis of the urethra is not to be confused with tuberculosis of the glans penis, as Lazarus has reviewed the latter condition and terms it a primary infection, occurring either from coitus or from circumcision. The lesion in this instance is a large tuberculous ulceration occurring on any portion of the glans penis and extending into the urethra. Such must not be confused with the tuberculous infection of the urethra as the latter is a secondary infection from some previously infected genital organ. Here also, as in the primary infection, there may be an ulceration on the glans penis, but this is always present at the meatus. Hinman states that males are more often affected with urethral tuberculosis than females. This can readily be understood, as the urethral infection is secondary to a previous infection of the genital organs rather than of the urinary organs.

It is impossible for the tubercle bacillus to be introduced through the meatus into the urethra clinically, but reports by Walker show that it has been experimentally introduced, thereby causing the infection. The infection is a descending one, the posterior urethra being infected first, then the anterior portion, and finally the urinary meatus. The bulbous urethra is more often involved than the anterior urethra.

There are three successive stages of the disease in the urethra, first, very minute tubercles, secondly large tubercles and ulcerations, third-

ly the stage of caseation. Walker also states that as in all other tuberculous infections of the genital tract, the disease is seen to start just beneath the epithelium where there is seen a small cellular aggregation, which later invades the overlying epithelium and forms the minute tubercle which can be seen with the naked eye. An erosion of the epithelium soon occurs, and a tiny ulcer is formed. The organisms at the same time invade the submucous tissues and finally the deeper tissues with the formation of a caseous infiltration more or less widespread. Pelouze mentions the lesions found in the posterior urethra as lymphoid-like masses, also ulcerations and cheesy infiltrations. As the process advances through the anterior urethra, the same changes occur here as in the posterior portion, and eventually the whole urethra becomes a rigid hollow tube as the result of deposits of calcium salts on these ulcerated areas. When the meatus and the region of the glans penis about the meatus become involved, the process of eventual ulceration starts as minute tubercles, which gradually spread, coalesce and may invade the deeper structures of the glans. As a rule these ulcerations are symmetrically placed on either side of the meatus, and instead of extending around the circumference of the meatus, extend down toward the frenum. It is doubtful if the intraurethral lesions ever break through to the outside of the penis. When the process has reached the stage where the urethral membrane and submucous tissues of the urethra have been invaded, there will always be an abundant purulent discharge. Pelouze says that when there is an apparently causeless discharge from the urethra, a diligent search should be made for the tubercle bacillus. From such a pathological condition one would expect to find a resulting stricture of the urethra as in the ureters, but this is not the case. Keves claims such to be rare, as does also Hinman who states that if a urethral stricture occurs, it will be in the end stages of the disease, the lesions having healed.

In establishing the diagnosis of tuberculosis of the urethra, one will find that he is dealing with a long continued, purulent urethral discharge which is inexplicable until a diligent search is made for the tubercle bacillus, and such will not be found in the smear of the discharge, but in the repeated centrifuged specimens of urine. There will also be a history of a previous tuberculous infection of the genital organs rarely of the kidneys. There will most likely be evidence of a generalized tuberculous infection, and, if in the later stages of the lung infection, such may be of the milary type.

Kilburn, Ira N. — Urologist Springfield Hospital and the  
Wesson Memorial Hospital Springfield Mass. For record and  
address of author see This Week's Issue page 131

tion as to the facts upon which he shall be asked to base an opinion." This bill was copied after English Law. It was rejected by both the House and Senate.

House Bill 305 was an act amending an act concerning operations for the prevention of procreation. The committee recommended that this bill be indefinitely postponed.

House Bill 446 was a bill requiring a special form of certificate when death occurred within a period of six months after the administration of any serum antitoxin or surgical operation, giving the date of the injection or inoculation and a statement of its probable or improbable relation to said death. Such certificate was to be filed with the Board of Health, and the said deaths to be tabulated in the annual reports of the Boards of Health. Rejected.

Substitute for House Bill 445, An Act concerning the practice of Chiropody, providing a Board of Registration and Examination five members appointed by the governor at recommendation by The Connecticut Pedic Society. Specified conditions relating to the annation of candidates and their education together with the subjects to be covered were incorporated in the bill. A definition of practice of Chiropody was included with certain restrictions. Not passed.

An Act was introduced amending an act which would give Osteopaths the rights of reciprocal relations with Osteopaths in other states. This bill after stating the requirements necessary for an applicant to become licensed, namely the ability to pass examinations to the satisfaction of the examining board in the following subjects: "Anatomy, Physiology, Pathology, Gynecology, Obstetrics, Chemistry, Toxicology, Hygiene, Public Health, and Dietetics and the principles and practice of Osteopathy and such other branches as are taught in well regulated and recognized schools of osteopathy and deemed advisable by said board." A certain exemption was incorporated to the effect that a license may be granted without such examination to any person who has been in active and continuous practice of Osteopathy for three successive years in any other state who shall satisfy the board as to his fitness to engage in such practice. This bill was passed.

House Bill 285. The Optometry bill simply called for examination and registration and was not opposed by the Legislative Committee of the Medical Society because the latter felt it was one step "to prevent fakirs from imposing on the public in the way of cheap eye glasses." The optometrists agreed that they would insert a clause preventing anyone who received a license from using the title *doctor* either as a prefix or otherwise. Passed.

House Bill 98, a bill concerning the practice of Naturopathy was indefinitely postponed (Naturopaths licensed in 1923).

House Bill 296, was a bill exempting cancer from the provisions of the *Medical Practice Act* in the interest of a certain Mr. Man as was also Bill 712 which would grant a special license to one Barner Gilchrist of New Haven to treat cancer (in other words these two bills would grant the aforesaid men the right to treat cancer without the possession of a certificate of registration from the State Board of Health which certificate could be granted only after an examination). Both bills were rejected by both houses.

#### 1915

Senate Bill 73 provided for the appointment of a State Board of Chiropractic Registration and Examination, and defined its duties. It was reported unfavorably by the committee, rejected by the Senate, and tabled by the House.

House Bill 304 was an act concerning practice of Naturopathy. It was reported unfavorably by the committee and indefinitely postponed by the Senate and the House.

#### 1917

Compulsory Health Insurance was considered inadvisable by the House of Delegates in the Connecticut Medical Society and no bill was sent to the Legislature.

The Committee of the State Society on New Examining Boards reported it inadvisable to urge any modification of principles underlying the Medical Practice Act of 1893 but recommended that one year hospital service be added as a qualification for license.

Too short a space of time has been reviewed for your committee to offer any deductions or conclusions but there are one or two facts which are quite noticeable. (1) the temerity of these various groups interested in healing the sick is tremendous. Starting with what might be termed only part of the proverbial shoestring, absolutely void of any fundamental basic principle they first build up a clientele among the gullible public then go before the General Assembly with bills for legislation, regulating and controlling their art (practical skill) or shall I say craft (trade) certainly not their science (accepted facts as demonstrated by observation or experiment). And the General Assembly amazed at the following already built up by them and knowing that that following is certain to grow has granted legislation before the practice becomes a real menace at least that is what the legislators say. (2) Their tenacity is unlimited. Often repulsed at first they appear at the next legislative session probably a little more modest than at first but nevertheless there and willing to accept a very small portion of the loaf but resolved each succeeding time to seek more crumbs and eventually acquire a whole loaf.

The Optometry Bill of 1913 simply called for the examination and registration of optom-

The discharge from the meatus decreased although the ulceration on the glans penis was spreading. The patient was kept out in the sun with the penis exposed to the sun's rays and while the pain was not so severe the ulceration continued to spread. He was having night sweats. Due to the fact of his tuberculous infection it was deemed wise to transfer him from the Springfield Hospital to the City Isolation Hospital. He was discharged three weeks after admission. He lived eleven days following his transfer. It was reported that after he left the Springfield Hospital he had meningeal symptoms and died in coma. Unfortunately, no postmortem examination was obtained.

## SUMMARY

1. A case of tuberculosis of the urethra is reported.
2. It is apparent from the literature reviewed that this is a rare condition which is not as

sociated with tuberculosis of the kidneys but of the genital organs.

3. Treatment must be by surgical intervention, which consists of removing the penis and entire genital tract, if a cure is to be expected, and that only when the lungs are not affected.

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## A REVIEW OF MEDICAL LEGISLATION IN CONNECTICUT FROM 1911 TO 1935\*

BY HENRY N. COSTELLO, M.D.†

**Y**OUR committee desires to present this report in the form of an historical review rather than as one from which conclusions may be drawn and recommendations made. The original intention of the committee was to review all bills pertaining to medical practice which were presented to the Connecticut General Assembly for the past twenty-five years, to ascertain the fate of these bills, and also, if possible, to discover the reasons why they were or were not enacted into law.

Beginning with 1911 the first bill was House 662, "An Act providing for the appointment of a state insanity commission whose duty it shall be to inquire into the sanity of an accused who is to be defended upon the ground of insanity." This bill was unfavorably reported and rejected. Today the court appoints a committee of physicians to pass upon the sanity of the accused.

House Bill 341 was "An Act concerning the distribution of drugs and medicines, providing that no person shall distribute any medicine pills, powders, envelope or package containing any drug or poison in any street or highway or from house to house." Passed.

The committee "On Public Policy and Legislation" considered some change in the practice of expert medical testimony and deemed it almost impossible to secure any legislation.

House Bill 273 was an Act providing that doctors practicing their profession in New York State be allowed to practice in this state with certain conditions. Rejected.

House Bill 330. An Act repealing an act concerning an operation for the prevention of procreation. Rejected.

In 1913 there appeared more legislative material of a medical nature than in any other year. House Bill 642 was an act concerning personal examination of plaintiff in action for personal injuries, and was reported unfavorably and rejected because "no useful public service" would be gained by the passage of this act. The right of the defendant for such examination is usually conceded. The bill would have given statutory right to the defendant to demand such an examination, and under existing law the plaintiff can protect himself from imposition through such examination and also from embarrassment if the plaintiff is a woman.

Maltbie\*. This bill provided that the court should appoint two examining physicians and failure to comply with the Court's orders on their part would be considered ground for non suit.

House Bill 642 provided for the commitment of persons charged with crime who used insanity as the defense. The bill recommended that such a defendant be committed to the State Insane Asylum by the court and there his mental condition should be determined. The bill was rejected because it would be an infringement on the Constitutional Rights of the defendant in committing him to an insane asylum before being adjudged insane.

House Bill 647 was an act concerning expert medical witnesses in criminal cases. This provided that no person "shall be qualified to give opinion as a medical expert witness in any criminal action until he shall have entered into a full and complete conference with the medical or surgical experts to be called by the opposi-

\*The first half of this paper covers the subject from 1911 to 1919 and was delivered at the annual meeting of the Hartford County Medical Association in April, 1935, and the latter half from 1919 to 1935 inclusive was read at the annual meeting of the Hartford County Medical Association in Hartford in April, 1935.

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The Justice of the Supreme Court who wrote the decision.

fact any variety of healer that can gain their confidence. It does not seem probable that any united effort on the part of the medical profession is likely to alter the condition of affairs. Reform in this respect must come from the general public and not from the medical profession for it is obvious that propaganda on the part of our profession is misunderstood and attributed to selfish motives. Public opinion is as a rule warmly in favor of scientific sanitary improvements of any regulations concerning purity of food of the enforcement of municipal cleanliness and measures of similar broad scope for the improvement of public health. Any restriction of individual liberty in the choice of methods of healing will require a long course of education of public sentiment before it can be achieved."

### 1922-1923

The Committee on Public Policy and Legislation was inactive that year (an off year in the Legislature) but the Committee on Medical Examination and Medical Education became interested in the subject of illegal licensure. In March 1921 this Committee through its Secretary Dr. Robert L. Rowley, had written Dr. John T. Black, State Commissioner of Health and by whom licenses were issued that one of the examining boards, namely, the Eclectic Board had examined and passed an applicant who had been graduated from a regular school (College of Physicians and Surgeons in Boston) in 1908 and had taken the examination of the regular board eight times and each time failed to meet the passing mark of 75. He had been examined by the Eclectic Board passed with a general average of 85.3, and was licensed in February 1921.

A communication at that time from the Attorney General declared that the license had been issued illegally and should be revoked. Eventually the license was returned to the Board of Health but an appeal was taken to the Legislature in 1923 asking for the restoration of the license. (Dr. Robert P. Hammie). A similar appeal to the legislature was also made by another who had graduated from a regular school and presented himself to the Eclectic Board for examination and licensed. When the Board of Health canceled his license he appealed to the Legislature and the latter restored his license being of the opinion that he had innocently made the mistake of appearing before the wrong examining board.

Bold indeed were the transgressors. That same year the Committee on Medical Examination and Medical Education received a communication from an attorney declaring that his client had not been justly dealt with by the Board and that unless that Board gave him the opportunity for a hearing with reference to a special examination for his client the

matter would be taken to the Legislature of the State. Eventually it was presented to the Judiciary Committee "with a good deal of sentiment in favor of going over the head of the Examining Board and granting to the individual a license to practice in this State although no examination had been made to determine the person's fitness to do so. This was the first time such an attempt had been made but matters had come to such a pass that most anything was to be expected. Final action in this case was temporarily deferred in the Senate.

It also became known at this time that for five years none of the examining boards had filed with the Commissioner of Health a list of the colleges acceptable to them as required by statute. The Board of Health was compelled by Statute to issue licenses when certificates were filed by the examining boards to the effect that the applicants were qualified and were entitled to the same. The statute also stated that every applicant must be examined by a Committee representing the same school of practice in which the applicant was "graduated" but no list of approved schools had been forwarded by any of the boards so that there was no way to check as to whether an applicant had been examined by the proper board.

The previous year the American Medical Association had attempted to bring before the public by means of an editorial the position occupied by Connecticut and Arkansas with reference to methods of medical licensure in these states. All the states but these two had abolished their separate boards of Eclectic Medical Examination or had limited their authority. There was some question as to whether the public was really interested. At least the press was not convinced that it was and that institution generally knows. To quote Dr. D. Chester Brown, Chairman of the Committee on Requirements for the Practice of Medicine: "I finally succeeded in securing publication of the editorial in the *Danbury Evening News*." The article was placed rather inconspicuously on an inside page in close proximity to an advertisement of 'Tanlac' with an even more prominent new heading.

### 1923

In Dr. David R. Lyman's Presidential address in 1923 he expressed the realization that from his tour of the county societies in the State there was "a universal feeling of dissatisfaction with the general conditions governing the practice of medicine in this State and especially with the attitude of the public toward us. I think that in general we feel that we have so to speak lost touch with the public. This is a condition disastrous alike to ourselves and to the public and demands our immediate attention. We recommend no

etrists and the latter agreed to insert a clause which would prevent anyone who received a license from using the title Dr as a prefix or otherwise. In 1929, however, they were given the legal right to use the prefix Dr.

### 1919

Thirty bills were introduced. Seven pertained to detailed changes in the laws regulating the Council of Health (the successor to the old State Board of Health), thirteen had to do with various sanitary measures in the State not of particular interest to the Connecticut Medical Society. Of the remaining bills H B 153 and S B 140 provided for compulsory vaccination, except that no child should be vaccinated if the parent objected. S B 124 made compulsory vaccination unlawful for schools and S B 295 made it unlawful for both schools and state institutions. H B 405 was a resolution against the use of all serums and antitoxins and S B 297 and H B 401 were acts regulating the practice of naturopathy and asking for the appointment of a Board of Naturopathic Examiners.

It is of interest to note here that it is the first time such a procedure has been mentioned, viz., that the Committee on Public Policy and Legislation was able to obtain through an excellent contact in the House (Dr Higgins who was Chairman of the Committee on Public Health and Safety of the Legislature), copies of all the bills of Medical Legislation before the Legislature for consideration.

The Committee on Deliberation decided to oppose those bills mentioned above and were successful in having all the bills rejected. The Chairman was Dr P H Ingalls.

### 1921

Dr E K Root, Chairman of the Committee on Deliberation.

Twenty-nine bills were submitted to the Committee for consideration and most of them were referred to the Commissioner of Health, as they were concerned with that Department. Those considered were as follows. A bill modifying the present statute concerning vaccination, H B 272, regarding vivisection and the Medical Practice Act.

The vaccination exemption bill was not opposed but a compromise was effected which resulted in the registration of all cases that conscientiously object to vaccination so that they may be identified, isolated and vaccinated in an emergency.

House Bill 272 prohibiting vivisection was opposed only by the Medical Society. No representative from Yale Medical School appeared. The bill was killed in Committee. House Bill 860 and its substitute were the joint work of the Committee on the Requirements for the Practice of Medicine, the Civil Code Commission and the Commissioner of Health.

The story of H B 860 and its substitute is very interesting. It must have been evident to some in authority that all was not as it should be in the realm of the healing arts. A Legislative Commission known as the Civil Code Commission, which had been appointed by Governor Holcomb for the consideration of a Civil Code that would consolidate and simplify many various public administrative organizations among them being the practice of medicine in its diverse and one may say its illimitable phases, requested the Connecticut State Medical Society to formulate a bill. The Committee on Requirements for the Practice of Medicine (Dr Brown) and the Committee on Public Policy and Legislation did "formulate a bill representing the views of the Connecticut State Medical Society and the Committee on Requirements in the matter of such a consolidation but it was clearly understood at the time that the Commission should consider it in conjunction with and after consultation with other organizations having authority to practice some phase of the art of healing the sick." The Communication was thereupon drafted by the Civil Code Commission and it was introduced and published as H B 860. It was at once labeled by the public as emanating from the Connecticut State Medical Society, arrogating to itself all the privileges of practicing the healing art and the storm broke immediately. The Civil Code Commission at once withdrew the bill and requested the State Board of Health to prepare a substitute bill which proposed to create an educational Board of Regents, similar to that in the State of New York. It was introduced by the State Commissioner of Health, Dr Black. The Board of Regents was to be composed of the Commissioner of Health, Secretary of the State Board of Education, the Attorney General and three persons appointed by the Governor who were to act with the various Boards to determine the qualifications for licensure, to define the particular branch represented by them and to examine such candidates as appeared before them. This bill was overwhelmingly defeated.

To quote Dr E K Root, "As a result of the meeting of March 6, 1921, held in New Haven, it was decided that there should be no concerted effort made for a large attendance for the Committee hearing on March 23. It probably would have made no difference had the profession been largely represented for the bill was defeated by a very large vote. It seems fairly obvious to your Chairman that there is no demand outside of thoughtful members of the medical profession, certainly not among the public at large for regulation or further legislation of medical practice. There is nothing in the attitude of the public to suggest that they desire any restriction on limitation of their individual liberty to employ at their will charlatans, quacks, naturopaths, mental healers or in



branch of the healing art was then given over to this Special Grand Jury. It has been said that no bill was ever presented to a Connecticut Legislature in more impressive manner or with more support from citizens of responsibility and organizations of representative people throughout the State. Since the introduction of this bill, however, selfish interests have been at work and through their influence the Judiciary Committee of the Legislature is expected to report unfavorably on it. At the same time it is expected that the Judiciary Committee will report as a substitute a Committee bill which will provide for the more essential features of the Grand Jury Bill and give to the people of Connecticut much better protection against ignorant practitioners than is given under the present law. The cost of the special Grand Jury Investigation was from \$70,000 to \$80,000.

Many bills on vaccination sera, guaranteeing purity etc. were presented. Fifty-five separate bills were introduced to validate the certificates to practice medicine issued on recommendation of the Eclectic Examining Board to a person named in each bill. These bills were unfavorably reported. Many other bills pertaining to Osteopathy, Chiropractic, and Naturopathy were before the Legislature. One in particular that all hospitals receiving State aid should be thrown open to the practitioners of all legalized healing arts was rejected.

#### 1926

The bill creating the State Board of Healing Arts a lay board to conduct examinations in the basic sciences of all applicants for a license to practice in any branch of the healing arts was passed. (The Connecticut Examining Board now examines the applicants from the allopathic or regular schools.) Certificates from the National Board of Medical Examiners were legally accepted.

#### 1927

The report of President Frank H. Wheeler regarding the Medical Practice Act passed in 1925 is of interest. At the Annual Congress on Medical Education, Licensure and Hospitals Dr. Ed Evans of LaCrosse, Wis., remarking on the law in his state said: "Seventeen days after the Wisconsin Act became law Connecticut passed a similar law but the genesis of the two was different. The Connecticut law was the result of the typical American reaction—laxity scandal outraged public opinion a stringent yet effective law. In Wisconsin the basic science act was the outgrowth of serious study by the House of Delegates and Council of the State Medical Society and education brought about by the Wisconsin Anti-Tuberculosis Association."

Laxity scandal outraged public opinion—

what an indictment against Connecticut! (See Committee Report by Dr. Robert L. Rowley.)

Many bills to validate the licenses of certain eclectic physicians both in 1925 and 1927 legislatures were defeated and at that time thirty to forty eclectic physicians whose licenses were revoked by the Special Grand Jury in 1923 were allowed to continue to practice while their appeals were pending in Court.

In 1926 the Committee on Medical Defense recommended that the Society at the next Legislature present a bill limiting the contract aspect in a suit against a physician, dentist, surgeon and hospital, to one year. The Supreme Court had just ruled that suit might be brought any time within six years. The bill roused much interest among the physicians in the state and especially in Hartford, yet at the hearing before the Legislature one physician was there as its sponsor viz. the Chairman of the Committee on Public Policy and Legislation, Dr. Robert L. Rowley. May I quote from his report, "The bill met with considerable opposition from lawyers of a certain type, and it was finally rejected. Apparently your Chairman was mistaken in his notion that the physicians were interested in this proposed legislation."

Many bills were introduced proposing new features or amending the law concerning practice in the various branches of the healing arts. Practically all were rejected by the Judiciary Committee and a substitute bill brought in by that Committee which was passed just at the close of the session provided for uniformity in the issuance and revocation of licenses for practitioners in all branches of the healing arts and also provided for the annual registration with the State Board of Health with the annual fee of \$2.

Many good features appeared in the bill, as the control by our examining board over those of the regular school with reference to revocation and suspension of license or otherwise disciplining a physician for any one of a number of specific causes.

The principle of annual registration of all practitioners of the healing arts is something to be approved. It has its advantages especially for the public as a means of protecting it against illegal practitioners but the expense for this protection is paid for by the registered practitioners. For the first time so far as the records show, the active service and assistance of each Committee on Public Policy and Legislation for each County Association was enlisted.

#### 1929

An Amendment to the Statutes of Limitations was secured under which action to recover damages for injury to person or property could be brought against physicians, hospitals and san-



material change in the state organization but rather a better functioning organization so that it would be better informed with reference to medical legislation, we recommend that the County and City Societies have Committees on Public Policy and Legislation to function as subcommittees of the State Committee, and also that the County Secretaries meet with the State Secretary twice yearly, just before the County meeting, and consider the problems of the organization." By such a plan it was his hope to "make our Society a very active factor in State affairs and regain in time the prestige which we have undoubtedly lost." It also became quite evident about that time that the General Assembly realized that there was a crying need for systematic control by the State of conditions governing the practice of the healing arts, and that it (General Assembly) was in the mood to make some change toward that end, their belief being as follows: "The doctors are unable to get together on anything, so it is up to us to take the matter into our own hands." The Judiciary Committee in conference with Dr. Eddy of Collinsville, the Chairman of the Committee on Public Health, drew a bill which proposed as follows: A Commission on Healing Arts should be created which should pass on preliminary education and moral fitness of all candidates and should give all candidates for license in any legalized school a uniform examination in fundamental medical education, embracing Anatomy, Pathology, Physiology, Chemistry, Hygiene, Histology, and Diagnosis and Prevention of Disease, including the provisions of the General Statutes concerning the protection of public health. It should then certify the candidate to his own board for examination in whatever other subjects his own Board desired and no one could procure a license without the certificate of both boards, and could be examined only by that Board with which he had originally registered. The preliminary board was to be composed of three laymen, and one representative of each of the six legalized cults—Allopathy, Homeopathy, Osteopathy, Eclecticism, Chiropractic and Naturopathy.

When it became apparent that the bill could not pass, the State Society sought the aid of the State Osteopathic Society and they joined forces with the Connecticut State Medical Society in a substitute bill, once they were assured that the State Society approved of so radical a change. Whether this was a fortunate step I leave to your judgment for although the new bill passed both House and Senate it was nevertheless vetoed by the Governor (Templeton) and never became law. Nothing had been gained in improving conditions but in seeking the help of the Osteopathic Society we had been placed under an obligation to that group of which they expected to take advantage. They did so at a later date.

The eclectic and unofficial representatives of the osteopaths opposed the bill. This substitute bill did establish the principle of minimum preliminary medical education for all schools, also moral fitness and examinations only by the Board representing the school from which the applicant was graduated.

1924

The Governor vetoed the substitute bill, also one which was to validate the licenses of twenty physicians practicing in this State with licenses that had been obtained in violation of law, according to the opinion of the Attorney General.

In vetoing the Medical Practice Act of 1923 Governor Templeton acted wisely for it would still leave the door open for that large number of doctors, apparently graduates of low grade medical schools, to flock to Connecticut, be licensed and allowed to practice. But, fortunately for the State, events began to happen which demanded serious action. One of the graduates of the diploma mills was arrested and charged with manslaughter as the result of an ether death and the information obtained by the *St. Louis Star* through the investigation of the diploma mills by one of its staff (Mr. Brundage), pointed to Connecticut as the haven to which the graduates of the diploma mills hastened in largest numbers. But remember all this information had been offered to the public and to the press one year before by the Medical Society, but no one was interested. When it came from a source outside the profession it attracted serious consideration.

What followed is probably well remembered by most of you who were in practice then. At the request of State Attorney Alcorn, "The Superior Court of Hartford County appointed a Special Grand Jury with almost unlimited power to investigate the whole question of qualification and practice in the healing art in this State. On the evidence disclosed the Special Grand Jury requested a revocation of 175 Medical licenses, about half of which were held by persons outside of Connecticut." Appeals against the decision were immediately filed in seventy-six cases and I believe there are still some of those persons practicing whose appeals are now pending. At last the public had become aroused by the fact that there were many practitioners in the State, "graduates" of schools that were absolutely unable to give their students a reasonable and proper education in the medical sciences. What the profession had been unable to do, the sources outside the profession accomplished.

The responsibility of formulating a new bill that would provide for the safety of the people of Connecticut, through the requirements of a reasonable educational standard on the part of those who wished to practice in any

upon While in the majority of instances this policy has been considered sufficient or all that we could properly take it is becoming more evident that an organization of the profession for personal contact with the individual legislators at their homes will be necessary. Certain individuals believe that the Society should employ an attorney to handle all legislative matters in a real political fashion, your Committee has not yet been brought to that conclusion.

'Civil legislation was not a source of much concern during the 1933 session. The Chiropractors had a bill which would permit them to sign death certificates one which would classify them as 'physicians' under the meaning of our law and grant them certain additional privileges and a bill which would permit them officially to treat compensation cases. These measures were all rejected the first two largely through the representations of the State Commissioner of Health, the compensation measure by the Compensation Commissioners and the Manufacturers' Association this Society is being recorded in this instance.'

Four Acts were presented concerning property exempt from attachment and execution.

Among the items specified were "the horse of any practicing physician or surgeon of value not exceeding \$200.00 and his saddle, bridle, harness and buggy." These bills all sought to modernize these exemptions about as follows "to exempt a physician's automobile used in conduct of his business, his tools, instruments, equipment, etc." These bills were all reported unfavorably by the Committee and a substitute bill drawn and passed which simply deleted from the existing statute the phrase regarding the physician's horse, saddle, bridle, harness and buggy. It would seem to have been a modernizing of the statute to the physician's disadvantage by omitting him altogether.

S B 152—An Act concerning Practicing Medicine and Surgery without a License. This was a State Department of Health bill increasing the penalty provisions, to provide for first offense a prison sentence of not more than one year in the place of the prescribed fine or in addition thereto and for subsequent offenses to increase the maximum prison sentence from ninety days to one year. Thus the penalty was changed from a monetary fine to confinement.

H B 1161—An Act to remove the fee for Annual Registration of Practitioners of the Healing Arts. "This was the Society's bill for removal of the two dollars annual registration fee, without interference with registration based on the principle that registration was a protective measure for the people of the State the expense of which should not be borne exclusively by the practitioners and further the moneys from this registration were not used ex-

clusively for publication of the prescribed lists, prosecutions and costs of registration. The nurses were particularly active in support of this measure the fee being an actual hardship to many of these women at present. As was anticipated the necessity for income from any and all sources for State maintenance produced an unfavorable report from the Committee on Public Health and Safety and rejection by the Legislature. This bill must be continuously introduced in each General Assembly, until it is accepted."

To quote Dr. Mudock, Secretary of the Committee on Medical Examination and Medical Education: "Six osteopaths took the examinations, one in surgery and five in medicine and surgery and there were five failures."

### 1935

The proceedings of the Connecticut State Medical Society have not yet come off the press and only a few bills can be reported for the Session of 1935. A bill to revoke the annual \$2.00 registration tax received the same fate as its predecessors and was unfavorably reported by the Committee.

A bill was introduced and heard before the Judiciary Committee asking for parity between the physician last in attendance and the present preferred claimants in insolvent estates. This bill also was reported unfavorably by that Committee.

At present the list of preferred claimants in insolvent estates comprises the Probate Court, the administrator and the undertaker. Their claims must be paid first and the physician attendant during the last illness heads the next group of preferred claimants.

The story of the hearing on that bill would make a very interesting chapter which time does not permit in full but when told it will reveal the type of justice the medical profession may expect from the ordinary legislative committee. (Physicians were here advised to attend Probate Court hearings.)

What could be said of the so-called Coroner's Bill would consume hours and lest I appear to make this too personal a matter I shall give only a few of the high lights of the whole procedure. In the endeavor to lower the expenses of the administration of the state the Coroner's system was one of the first to draw the attention of those so interested and a bill was introduced and a hearing held before the Judiciary Committee which would entirely do away with the office of the Coroner and make the office of Medical Examiner one of appointment every three years by the Superintendent of the State Police. It was said that this bill originated in the Judiciary Committee but after the hearing it was declared unsatisfactory and a substitute bill was drawn. This substitute bill did not eliminate the office of Coroner but placed such

italian within two years after the date of such injury (instead of six years as it was previously)

Annual Registration with \$200 remained unchanged except to exempt those who are retired and those who labor without compensation. No action was taken to eliminate it with reference to physicians.

The optometrists became Doctors provided only that they appended to their name, initials or words indicating that they were optometrists only.

The naturopaths and chiropractors sought the right to sign death certificates. The first failed but the second group succeeded in the passage of the bill through "effectual lobbying and a friend or two at court." But it awaited the signature of the Governor. The osteopaths obtained the right to practice medicine and surgery provided they passed the examination in medicine and surgery given by the Connecticut Medical Examining Board (our Board).

Thus we have a group who are not M.D.'s and are permitted to take the examinations in part of another board, not representing the branch of the healing arts of which they are graduates. This bill was not opposed by the State Medical Society after conference with a special committee so appointed by the president, but may I recall to your memory the fact that we had solicited their aid in attempting to pass a medical practice act in 1923.

### 1931

Elias Pratt, was Chairman of the Committee on Public Policy and Legislation.

May I here quote from the Committee Report of 1931: "The employment of a paid attorney for the Society during the session of the General Assembly was discussed by the Committee alone and in conference with the Council, the final answer was the employment of such a person during the present session—somewhat as an experiment—but chiefly because it was feared legislation would be introduced in such a way that the Society would have no opportunity to oppose it or take proper measures. Full evaluation of this procedure cannot as yet be given. If it proves its worth, measures must be taken to provide a legislative fund for the Society."

Of the many bills which came up for hearing those of most interest to those practicing medicine are as follows:

S B 212—An Act amending an Act concerning Annual Registration of Practitioners of Healing Arts. This act exempted those practicing nursing without pay from the annual fee but not from annual registration. Passed.

S B 213—An Act amending an Act concerning Medicine and Surgery. By this Act there was afforded a basis for action against any new or

sporadic groups which might appear and claim the right to practice under the too general exemption clauses of the present law. These changes all constituted a considerable forward step in strengthening the present practice.

S B 496 An Act concerning the Limited Licensing of Hospital Medical Officers. "This bill, introduced at the request of the New Haven Hospital and the Yale University School of Medicine, was heard before the Committee on Public Health and Safety February 26, 1931. It would provide a form of limited registration without examination for internes and medical officers in hospitals and institutions maintained by the State, county or municipality, or in hospitals or other institutions incorporated under the laws of the State, entitling the holder to practice medicine only in the work of the hospital or other institution designated in his limited certificate, under regulations established by the hospital or other institution.

This bill was so loosely drawn and so at variance with existing law, without providing for repeal thereof, as to render it unacceptable on its form alone. It was submitted without reference to the medical profession for comment or criticism. Not passed.

H B 978 An Act amending an Act concerning Doctor's License Fees. This bill was presented by the Committee on Public Policy and Legislation of the Fairfield County Medical Association despite the official action of the House of Delegates of the Connecticut State Medical Society and sought the removal of the \$200 annual registration fee for practitioners of medicine and surgery. This bill was unfavorably reported by the Legislative Committee because that committee was aware of the action taken by the House of Delegates of the State Society.

### 1932

To quote the Committee on Medical Examiners and Medical Education: "Five osteopaths took the examinations, two wrote surgery and three medicine and surgery. There was a total of three failures or sixty per cent."

### 1933

Sanford H. Wadhams was the Chairman of the Committee on Public Policy and Legislation.

"In all but one instance the policy of the Committee has been to give the legislators, through appearance at the Committee hearing the attitude of the Society upon any given measure and the reasons therefor and to do nothing further except through occasional informal discussions or comments with individual legislators. The full estimate of the results of this policy cannot yet be determined for many of the measures in which we were particularly concerned have not been fully or finally acted

CASE RECORDS  
of the  
MASSACHUSETTS GENERAL  
HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED  
IN WEEKLY CLINICAL PATHOLOGIC EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

FRANCY B. MALLORY, M.D., *Editor*

CASE 22291

PRESENTATION OF CASE

A seventy-three year old American woman was admitted complaining of pain on the left side of the abdomen and back.

The patient was well until six months before entry at which time she became aware of a sensation of soreness in the lower sternum which she folded her arms across her chest. This sensation gradually shifted downward into the left upper abdomen and two months before entry became dull and aching in character. The ache was inconstant and was brought on by movement. More recently it became constant burning in character and radiated to the left back. Occasionally there was sharp and shooting radiation to the left shoulder. During the week preceding entry there were mild colicky pains localized to the left upper quadrant. The sternal discomfort had disappeared. Just before coming to the hospital she was unable to lie prone because of the pain and she discovered also that coughing and deep inspiration aggravated the discomfort. For several months her bowel movements had been irregularly constipated but four days before admission she suddenly developed loose watery diarrhea with movements occurring about eight times daily. The stools were dark brown and contained occasional hard pellets and some yellowish mucus. There were no bloody or tarry stools. Rectal urgency was at times so great as to verge upon incontinence. Her appetite was unimpaired and there was no nausea or emesis. Her weight had diminished from 150 to 111 pounds during the preceding ten months.

She had had an appendectomy performed twenty-one years before entry and an operation for gallstones a year later. Three years ago she had pruritus and polydipsia and was told by a physician that she had diabetes mellitus. She was given a diet and her urine was checked at intervals.

Physical examination showed a frail emaciated elderly woman in no acute discomfort. The fundi showed a small patch of retinitis on the right side. The retinal vessels were nar-

rowed. The heart was not enlarged and a soft early systolic murmur was heard best at the base. The lungs were clear. The blood pressure was 150/80. The abdomen was tense and tenderness was elicited high in the epigastrium and in the left upper quadrant, where a suggestion of an ill-defined mass was obtained. There was edema of both ankles.

The temperature, pulse, and respirations were normal.

Examination of the urine showed a specific gravity of 1.035. There was no albumin but a yellowish-green precipitate was obtained with Benedict's solution. The sediment contained many white blood cells and epithelial cells. The blood showed a red cell count of 3,760,000 with a hemoglobin of 60 per cent. The white cell count was 7,750. 82 per cent polymorphonuclears. Stool specimens were normal in color, liquid to putty in consistency, and gave positive reactions to the guaiac test. A Hinton test was negative. The nonprotein nitrogen of the blood was 32 milligrams. The serum protein was 5.4 per cent. A  $\text{CO}_2$  combining power was 53 volumes per cent. The chlorides were 94 cubic centimeters. An 11 a.m. blood sugar estimation was 234 milligrams. An electrocardiogram showed left axis deviation with rather small complexes.

A barium enema passed to the cecum without delay. The colon showed marked spasm in the region of the sigmoid and numerous diverticula were demonstrated in this region. Later a plain film of the abdomen showed considerable gas in the stomach and a moderate amount in the region of the splenic flexure and distal transverse colon. No dilated loops of small intestine were present. There was retained barium in the diverticula.

The patient's diabetes was moderately well controlled so that frequent urine specimens were sugar-free although an occasional green precipitate was obtained with the Benedict test. The blood sugar however remained between 177 and 232 milligrams. Repeated stool examinations showed positive reactions to the guaiac test and some were grossly bloody. The temperature showed occasional rises to  $100^{\circ}$  but for the most part remained normal. A proctoscope showed normal rectal mucous membrane. With symptomatic treatment the diarrhea gradually lessened. The patient's general condition improved slightly although her abdominal discomfort persisted and she required repeated doses of opiates for relief. One month after entry an exploratory laparotomy was performed.

NOTES ON THE HISTORY

DR. GEORGE A. LELAND. As we will see in a moment the pain was in the upper part of the left abdomen. That is always a very intriguing area from which to start upon a diag-

Coroner under salary, as well as the Coroner's secretary. It raised the Coroner's remuneration in one county by \$1900 and lowered it in another by the same amount. In all, this bill saved \$700 in Coroner's fees. It reduced the Medical Examiner's fees of \$10 for an external examination to \$5. The previous year the 130 medical examiners of the State had received in fees \$40,000. This bill then was to save for the state \$700 in Coroner's fees, and \$20,000 in Medical Examiner's fees. Just another example of what our profession may expect from a certain type of politician. I use the term "certain type of politician" for I would like to say here that there were some members of the state senate who, knowing something of the responsibilities of the office, labored valiantly against this bill inspired by a sense of justice but they were in the minority. Ungrateful indeed would I be, were I especially at this time not to mention the part played by the officials of our County Association and especially its president. Considering the whole procedure as an affront to the entire medical profession as well as an injustice to the medical examiners, he not only publicly denounced it through the press but wrote the Secretary of our State Society acquainting him with the facts and requested Dr. Comfort to write in protest to the Governor. This was done, but for naught. The Governor was also asked for a special conference so that he too might have the facts and possibly veto the bill, but the conference was refused.

And so we come to the end of a review of medical legislation in this state, over a period of twenty-five years. And what are the facts to be gleaned from such a résumé?

(1) That the men who have labored with these legislative problems have done so against professionally organized groups, great odds and practically unassisted.

(2) That the various cults became not in the least discouraged with the exposures of 1923, that their power has increased year by year as shown by some new piece of legislation favorable to them, but that the number of the various cults has probably now become fixed by statute.

(3) That the public has been fairly well educated in matters pertaining to public health and preventive medicine but is absolutely ignorant of its debt to the medical profession (gratuitous ward service, free clinics, increase of high standards of training and so forth).

(4) That the prestige of the medical profession today is at its lowest ebb among legislators and that they recognize only power—the power of organization.

And finally, that our greatest problems are awaiting us. And how are we to meet these problems?

(1) By educating the public. Inform the public by monthly press notices issued by the

County Association as to the public services rendered in hospital wards, clinics, flood emergencies, and so forth.

(2) By medical representation in the General Assembly. Let each County endeavor to seat one of its members in the Legislature. Doctors have been members of the General Assembly before (Dr. Higgins and Dr. Eddy), and were of great assistance. A friend at Court is a great asset.

(3) By advice and assistance from outside the profession. Give those members of the County and State Committees on Public Policy and Legislation the legal assistance they should have.

(4) By a non-bound organization. Make it possible for every member of the State Society to know and express his opinion on legislation pending so that he will become "organization conscious".\* And make it possible to use the potential power of such an organization so that if ever the State Society refused en masse to pay the \$2 annual registration tax the first prosecution would immediately stop the gratuitous work in all the ward services in all the hospitals in the state and at the threat of State Medicine be so enabled to present such a united front as to make it possible for us to have a hand on the controls of our medical destiny.

#### RESOLUTION NO VII

PRESENTED TO HOUSE OF DELEGATES MAY 1935

Resolution Concerning Special Meetings of the House of Delegates and County Associations to consider bills pertaining to the Medical Profession pending before the Legislature.

Presented by Henry N. Costello, M.D., Hartford  
Delegate from the Hartford County Medical Association

'Resolved—That the Council present at the next annual meeting such changes in the By-Laws as will be necessary to effect the substance of the following resolutions:

'Resolved—That the County Associations shall hold a winter meeting during the last week of January of each legislative year so that each County Association shall learn from its Legislative Committee the nature of the bills pending before the Legislature and that each County Association shall take action on each bill and instruct its delegates as to the association's desire regarding each bill, so that then the delegates may carry out the desire of the County Associations in the House of Delegates.

Resolved—That the House of Delegates of the Connecticut State Medical Society shall hold a special meeting within the first five days of February of each legislative year to learn the desire of each County Society with reference to each bill pending before the Legislature, and take action on these bills in order that the Committee on Public Policy and Legislation of the State Society or its representatives at the Legislature shall know what the opinion and desire of the State Society as a whole are in respect to each bill.

Recommendations were tabled

\*See resolution at the end of this paper

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The patient was well until six months before entry at which time she became aware of a sensation of soreness in the lower sternum when she folded her arms across her chest. This sensation gradually shifted downward into the left upper abdomen and two months before entry became dull and aching in character. The ache was inconstant and was brought on by movement. More recently it became constant burning in character and radiated to the left back. Occasionally there was sharp and shooting radiation to the left shoulder. During the week preceding entry there were mild colicky pains localized to the left upper quadrant. The sternal discomfort had disappeared. Just before coming to the hospital she was unable to lie prone because of the pain and she discovered also that coughing and deep inspiration aggravated the discomfort. For several months her bowel movements had been irregularly constipated but four days before admission she suddenly developed loose watery diarrhea with movements occurring about eight times daily. The stools were dark brown and contained occasional hard pellets and some yellowish mucus. There were no bloody or tarry stools. Rectal urgency was at times so great as to verge upon incontinence. Her appetite was unimpaired and there was no nausea or emesis. Her weight had diminished from 150 to 111 pounds during the preceding ten months.

She had had an appendectomy performed twenty-one years before entry and an operation for gallstones a year later. Three years ago she had pruritus and polydipsia and was told by a physician that she had diabetes mellitus. She was given a diet and her urine was checked at intervals.

Physical examination showed a frail emaciated elderly woman in no acute discomfort. The fundi showed a small patch of retinitis on the right side. The retinal vessels were nar-

rowed. The heart was not enlarged and a soft early systolic murmur was heard best at the base. The lungs were clear. The blood pressure was 150/80. The abdomen was tense and tenderness was elicited high in the epigastrium and in the left upper quadrant, where a suggestion of an ill defined mass was obtained. There was edema of both ankles.

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Examination of the urine showed a specific gravity of 1.035. There was no albumin but a yellowish-green precipitate was obtained with Benedict's solution. The sediment contained many white blood cells and epithelial cells. The blood showed a red cell count of 3,760,000 with a hemoglobin of 60 per cent. The white cell count was 7,750. 82 per cent polymorphonuclears. Stool specimens were normal in color, liquid to putty in consistency, and gave positive reactions to the guaiac test. A Hinton test was negative. The nonprotein nitrogen of the blood was 32 milligrams. The serum protein was 5.4 per cent. A  $\text{CO}_2$  combining power was 53 volumes per cent. The chlorides were 94 cubic centimeters. An 11 a.m. blood sugar estimation was 234 milligrams. An electrocardiogram showed left axis deviation with rather small complexes.

A barium enema passed to the cecum without delay. The colon showed marked spasm in the region of the sigmoid and numerous diverticula were demonstrated in this region. Later a plain film of the abdomen showed considerable gas in the stomach and a moderate amount in the region of the splenic flexure and distal transverse colon. No dilated loops of small intestine were present. There was retained barium in the diverticula.

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NOTES ON THE HISTORY

DR. GEORGE A. LELAND. As we will see in a moment the pain was in the upper part of the left abdomen. That is always a very intriguing area from which to start upon a diag-

nostic journey because it is not common to have abdominal pain center there

"She became aware of a sensation of soreness in the lower sternum when she folded her arms across her chest." That symptom does not indicate much to me up to this point, but I would call your attention to the fact, if you will skip down to the last sentence, that her weight had diminished from 150 pounds to 111 pounds during the preceding ten months. I think we should assume that the present illness began four months prior to the six months' period of discomfort which she had been noticing

So far we have evidence of pain which began as soreness in the sternum and then became an ache, boring in character, which became more and more constant and which radiated to the back indicating presumably close attachment to the posterior abdominal wall

"Occasionally there was sharp and shooting radiation to the left shoulder." That would suggest perhaps irritation of the diaphragm of which we have further evidence later on

"During the week preceding entry there were mild colicky pains localized to the left upper quadrant." That suggests the possibility of bowel irritation

"Just before coming to the hospital she was unable to lie prone because of the pain and she discovered also that coughing and deep inspiration aggravated the discomfort." That is more evidence of diaphragm irritation and by the same token if there was something growing there it was apparently increasing rapidly, because she could not withstand pressure on the abdomen

Then we come to a new chain of symptoms. She suddenly developed loose watery diarrhea, with movements occurring about eight times a day. That certainly puts the spotlight on the large bowel in the vicinity of the left upper quadrant

The hard pellets were perhaps gallstones coming down from a left-sided gallbladder. Perhaps she had been taking some patent medicine—"every tablet produces a gallstone in the stool"—or the pellets may have been fecoliths coming from the rugae of the large bowel or from some diverticula. The yellow mucus suggests some chronic condition of the bowel

"Her appetite was unimpaired and there was no nausea or emesis." That would rather seem to rule out any physiological disturbance of the stomach

To summarize the present illness, we have loss of weight for ten months, increasing discomfort, accompanying pain in the left upper quadrant for six months, and for several months impaired bowel physiology with intermittent constipation and diarrhea. Those three major symptoms certainly point the finger very sus-

piciously to large bowel pathology. In a woman of seventy-three we would naturally think of malignant disease but this age is not too great for a person to have a primary diverticulitis

Now going on to further evidence in the case we find that she had an appendectomy twenty-one years ago, when she was fifty-two, and an operation for gallstones a year later. That would be twenty years ago, approximately. The gallstones might have been taken out and the gallbladder might have been taken out, but I think we can probably eliminate left-sided gallbladder as being responsible for the hard pellets in the stool. Presumably the gallbladder was on the right side

"Three years ago she had pruritus and polydipsia and was told by a physician that she had diabetes mellitus. She was given a diet and her urine was checked at intervals thereafter." That presumably establishes the diabetic background of this patient and would make us feel that the loss of weight was perhaps not entirely due to disease of the colon or malignant disease. What relation to gallstones the diabetes might have had, we will not discuss at the present moment

"Physical examination showed a frail, emaciated elderly woman in no acute discomfort." The last clause is of interest in view of the fact that she had had boring constricting pain and was unable to lie over on her belly because of the discomfort

"The fundi showed a small patch of retinitis on the right side." I think that can be accounted for by mild arteriosclerosis. Skipping down farther we find the blood pressure 150/80 which would seem to hook up all right with arteriosclerosis

"The abdomen was tense and tenderness was elicited high in the epigastrium and in the left upper quadrant, where a suggestion of an ill-defined mass was obtained." That is where all her complaints have been. How much value we can put on that last clause "ill-defined mass" is questionable. An ill-defined mass is one thing. "A suggestion of an ill-defined mass" would put it in the category of an even more remote possibility, especially in the presence of tenderness, and up in the left upper quadrant where the ribs overhang it is usually difficult to feel anything. If that mass means anything, I think we can say we are not dealing with a big spleen. That is always noted when present and would be definitely so stated

"Edema of both ankles" was perhaps due to cardiac impairment at seventy-three or perhaps we will find evidence of nephritis. There is nothing mentioned about jaundice so we presume that the skin and sclerae were perfectly clear. We interject that remark as a question so to speak, because it might have some bearing on the subsequent diagnosis



The temperature pulse and respirations were normal. That is against inflammation.

The yellowish-green precipitate with Benedict's solution goes with the 11 a. m. blood sugar estimation of 234 milligrams mentioned at the end of the laboratory notes and seems to establish a true diabetes.

"The sediment contained many white blood cells and epithelial cells." We presume that is not a catheter specimen. We do not know the exact significance. It might perfectly well go with cystitis or with nothing at all. The absence of albumin would make us think that there was no nephritis here, particularly where down below we find the nonprotein nitrogen to be 32 milligrams.

The blood examination showed a secondary anemia. The rest of the laboratory findings I do not think have much bearing. The serum protein was perhaps a little low. The  $\text{CO}_2$  combining power would rule out acidosis. The slightly lowered chlorides indicate a little depletion from the frequent watery stools she had been having. The electrocardiogram to a surgical mind such as mine does not mean very much but I would suppose that it is consistent with slight hypertension, arteriosclerosis and retinitis which she is known to have had. Now we are ready for the x-ray department to make a diagnosis for us!

DR. AUBREY O. HAMPTON: I assume that the examination of the stomach was entirely negative. There is no delay in the passage of the motor meal through the bowel. Here is retained barium within a diverticulum of the duodenum and we expect to find other diverticula elsewhere.

DR. LELAND: The x-ray indicated some impairment of physiology but not necessarily from intrinsic disease. The absence of dilated loops of small intestine seems to rule out any obstruction and we would expect, of course, to find retained barium in the diverticula.

DR. HAMPTON: I cannot see anything to make a diagnosis on except a diverticulum. Here is an empty colon. You cannot see the diverticula very well, one or two here. I do not see the marked spasm. This is a pretty smooth sigmoid. This film is of the area I suppose and it is not the picture we would get with acute diverticulitis. There is some spasm but I would not expect it to be very significant. No obstruction, no delay in emptying.

DR. LELAND: The hospital history further shows the diabetes moderately well controlled. The persistently high blood sugar determinations indicate that the patient had some intercurrent disease which made it difficult for the medical man to control the diabetes.

Then we come to the progressive condition

of the stools. She noticed no blood before she entered the hospital but the guaiacs were all positive in the hospital and some gross blood was noted.

The temperature rises to  $100^\circ$  would go with any condition that might cause bleeding in the colon, whether of extrinsic or intrinsic origin.

"The patient's general condition improved slightly, although her abdominal discomfort persisted and she required repeated doses of opiates for relief." That is a very significant point because the history of an increasing degree of pain indicates the likelihood of malignant disease.

#### DIFFERENTIAL DIAGNOSIS

With regard to the differential diagnosis we will sum up the situation as follows: ten months' loss of weight, six months' pain starting with soreness and dull ache, increasing discomfort that required opiates even with hospital care and management, several months' impaired bowel physiology, bloody stools, some mucus and secondary anemia. The discomfort and pain in the left upper quadrant, impaired bowel physiology and pain in the back and diaphragm indicate that there must have been some spreading lesion in that region. Therefore we would make a diagnosis of either carcinoma of the colon or diverticulum which had become infected and gradually penetrated through the wall, with spreading around the peritoneum. The above points are in favor of that diagnosis but against it of course are the negative x-rays. Of course there are silent areas in the colon and the flexures are notable in these silent areas. However, it seems extremely improbable that there should be a questionable mass or diaphragm irritation due to a lesion of the colon that would not show up in the x-ray. We have enough confidence in the x-ray department so that prior to the operation we would want to think of other possibilities. We would want to rule out the stomach because there is no x-ray report although there is no impaired physiology of that organ. The kidney is in that region. There is nothing to indicate kidney involvement. A renal tumor that would reach to the diaphragm and impair physiology of the colon certainly ought to be palpable in the flank. We would feel the same way about any retroperitoneal mass such as the lymphosarcomata. We would not feel that either of these two conditions would be sufficient to cause ulceration or bleeding in the colon. The tail of the pancreas is in this vicinity. Occasionally tumors do occur in the tail that assume large sizes without extending into the head and without causing biliary obstruction. But there again the pancreas is a retroperitoneal organ.

and we would not expect it to penetrate into the colon. There is only one other main organ in this vicinity, and that is the spleen. There is nothing in the story that would go with spleen. I have never seen the spleen cause pain in this way, certainly not in the absence of a marked febrile reaction. There is one other condition that has to be considered, namely, an aneurysm. Aneurysm of the splenic artery is said to be the most common of abdominal aneurysms. It is difficult, however, to line up the different symptoms, particularly with reference to the colon, with any such condition as that. For these reasons we would, having seen such a patient, advise exploration with the idea that we would find a lesion in the left upper quadrant portion of the colon, probably malignant, perhaps diverticulitis. We would feel if it were either of these conditions that the situation would be inoperable in so far as removability is concerned. I think we might be able to afford relief by short circuiting.

DR JAMES H. TOWNSEND: I saw this patient with reference to diabetes. The question was raised as to whether her bloody diarrhea and her other abdominal symptoms had anything to do with the diabetes. We do see persistent and very troublesome diarrheas in diabetics without anything else to account for the trouble. I have never seen a bloody diarrhea and I do not think I have seen any with a severe degree of pain. As I recall examining this patient's abdomen, the left upper quadrant was distinctly fuller than the right. One could feel quite easily in the right upper quadrant but in the left side one had a feeling that there was something there, very ill defined, but there was a fullness as if there were some diffuse mass in that region. We felt that there was something apart from the diabetes that was responsible for the symptoms.

DR CHESTER M. JONES: I remember this case very well. She was a very sick woman at the time. We were absolutely unable to get an adequate idea of the nature of her illness, or of the cause of the abdominal pain and the diarrhea. I proctoscoped her and found no abnormality of the rectum or rectosigmoid. As we watched her on the ward it became obvious that she was having pain of an obstructive nature and we saw visible peristalsis not infrequently in the abdomen. We were not able to make a diagnosis but most of us on the service felt that she had carcinomatosis with irritation of the bowel. She was seen three times, I think, by the surgeons. I remember Dr. Jones was on the ward one day and he saw her. Dr. McKittrick saw her twice and we finally decided to have her explored not with the idea of curing the disease but with the idea of relieving the partial obstruction and therefore her pain. We thought probably she had an inoperable condition.

## CLINICAL DIAGNOSES

Carcinoma of the colon  
Carcinomatosis  
Diabetes mellitus

## DR GEORGE A. LELAND'S DIAGNOSES

Carcinoma of the colon  
Diabetes mellitus

## ANATOMIC DIAGNOSES

Carcinoma of the pancreas with metastases to the liver, regional lymph nodes and peritoneum  
Peritonitis, chronic fibrous, focal  
Peritonitis, acute fibrinous, localized  
Diverticulosis of the rectum and sigmoid  
Pleuritis, chronic fibrous, bilateral  
Nephritis, chronic vascular  
Hydronephrosis, left  
Operative wound  
Exploratory laparotomy  
Operative scars  
Appendectomy, cholecystectomy  
Parotitis?

## PATHOLOGIC DISCUSSION

DR TRACY B. MALLORY: When this patient was explored metastatic tumor was found all over the abdomen and the surgeon was entirely unable to determine the primary site. She died a few days later and the autopsy showed that the growth had developed in the body and tail of the pancreas. The liver was full of metastases and there were numerous adhesions which might well have caused a considerable degree of intestinal obstruction, including one point in the ileum which was pretty sharply kinked. We did not find any source for blood in the stools. The gallbladder had been removed at one of her previous operations.

This is the third or fourth case of carcinoma of the tail of the pancreas with back pain as the primary symptom which we have taken up in these conferences.

## CASE 22292

## PRESENTATION OF CASE

A fifty-nine year old Negro laborer was admitted complaining of fever and cough.

The patient had been well until three weeks before entry, when he developed a bad cold associated with coryza, generalized aches and pains, and malaise, but no cough or fever. A few days later he was seen by a physician who found that he had a temperature of 103.5°. He was sent to bed and given an expectorant medication after which he began to cough and expectorated a small amount of whitish material. One week before coming to the hospital he was again seen by the physician and told that he had pneumonia. Subsequently he began to improve but on the night prior to ad-

mission he again felt quite feverish. There was no hemoptysis or pain. His appetite was poor and he was slightly constipated during his current illness.

The past history is noncontributory.

The patient had been married for twenty-one years and his wife had borne three children. There were no miscarriages.

Physical examination showed a well-developed and nourished, slightly delirious colored man who was sitting up in bed and breathing in a rapid shallow fashion. The pupils reacted normally to light and distance. Oral hygiene was poor and there was marked accumulation of sordes. The neck resisted flexion and there were a few small shotty nodes in both the cervical and axillary regions. The heart was enlarged to the left, the apex extending well beyond the midclavicular line. The right border was within normal limits. The sounds were rapid and fair quality, and an occasional extrasystole was heard. A systolic murmur was heard in the apical region and both systolic and diastolic murmurs at the aortic area. The blood pressure was 140 systolic and 40 to zero diastolic. A Corrigan pulse and Duroziez's sign were elicited. Peripheral arteriosclerosis was marked. Respiratory movement was inhibited on the right side. There was dullness to flatness over the right upper chest anteriorly from the fourth rib upward and posteriorly down to the angle of the scapula. In this region the breath sounds were bronchial in character, tactile fremitus and vocal resonance were increased, and crackling rales were audible. In the right upper axilla flatness was well defined and breath sounds and tactile fremitus were diminished in intensity. The abdomen was distended and tympanitic and the remainder of the examination was negative.

The temperature was 105.5°, the pulse 120. The respirations were 50.

Examination of the urine showed a specific gravity of 1.021 with a trace of albumin. The sediment contained occasional red blood cells, white blood cells, and hyaline and granular casts. The blood showed a red cell count of 4,300,000, with a hemoglobin of 70 per cent. The white cell count was 16,700, 80 per cent polymorphonuclears. A stool examination was negative. The blood chlorides were equivalent to 96 cubic centimeters of N/10 sodium chloride and the nonprotein nitrogen was 28 milligrams.

The patient's condition became rapidly worse and he died two days after entry.

#### DIFFERENTIAL DIAGNOSIS

DR DONALD S. KING. This is rather a meager history. It is that of an upper respiratory infection followed shortly afterward by lower respiratory infection. The infection ran an

up-and-down course apparently for three weeks. The patient came into the hospital, as it is noted later, slightly delirious and went steadily downhill and died in three days, so it is a very rapid course of a respiratory disease. The history is not characteristic of any particular infection. It is not lobar pneumonia with chill or pain or rusty or bloody sputum. It could be an atypical streptococcus pneumonia of which we have had many fatal cases. But it is not quite the characteristic course of those so-called streptococcus pneumonias. It is not characteristic of abscess since there is no foul sputum. There is reason to suspect any of the unusual infections, psittacosis, fungus, yeast and so forth. There is nothing in the story to suggest a primary condition such as malignancy with secondary lung infection. So the history does not help us much.

There are two things shown by physical examination, first, aortic regurgitation and left ventricular hypertrophy—I do not see how we can get away from that—secondly, consolidation of the right upper and part of the right lower lobes. I do not see how we can interpret the signs other than as the signs of consolidation, dullness to flatness, definite bronchial breathing, definite increase in spoken voice and tactile fremitus, with slight diminution of breath sounds in the axilla. The heart is not displaced either toward or away from the lesion, and if the heart examination as given is correct there is a definite left ventricular hypertrophy and not displacement. In addition we have a little stiffness of the neck and shotty nodes in the axillae and cervical regions.

In the first place we must rule out empyema in a case where fever has persisted for three weeks after a supposed pneumonia. I see no evidence of empyema so far as these signs are concerned. I think we can throw out this possibility. It is not like an undrained abscess. It could be, I suppose, but the signs are not characteristic. There is not the foul sputum of a drained abscess. Syphilis, if you think of that in connection with the heart, I do not believe can be made to explain the lung picture. There is no evidence of tumor plugging the bronchus with infection beyond. The picture is not like aneurysm with pressure on the bronchus and secondary infection. I cannot conceive of an infarct of this size without pain or bloody sputum. The stiff neck I would like to know more about. They did not pay much attention to it on the ward. No lumbar puncture was done. From the physical signs then we must conclude that there was persistent consolidation in the right upper lung with definite aortic regurgitation. The laboratory examinations are again meager. There is first what I consider a "fever urine." I do not see any evidence of nephritis. There is no anemia, a negative stool, a white cell count of 16,000,

80 per cent polymorphonuclears. I suppose the blood chloride and nitrogen were done as kidney tests rather than with any reference to the pneumonic process. Last winter blood chlorides were done on many of the pneumonia cases but I cannot believe it would be done after three weeks of atypical pneumonia. The blood chlorides are low in typical lobar pneumonia but come back to normal one, two or three days after the crisis, and this was certainly not in any case a typical lobar pneumonia. Of course we greatly need some other laboratory findings, such as the sputum. I assume there was none. There is no examination mentioned. We would like a blood culture. We would also like a Wassermann. It is not reported. We would like an x-ray of the chest which is not given here.

On the whole as the case stands I do not think we have evidence for any definite thing. This was a well-nourished Negro of fifty-nine, sick for three weeks with intermittent high fever, "a cold", no pain, not much expectoration, no blood, no foul sputum. The right side moved very poorly. There were definite signs of consolidation with râles. This picture in a fifty-nine year old Negro I think is more consistent with a tuberculous pneumonia, "galloping consumption", than with a streptococcus pneumonia or some other infection of that type. Then as a guess I would say tuberculous pneumonia, with no definite evidence of meningitis.

As to the heart condition, again we cannot do more than guess between rheumatic and syphilitic infection but I should think the guess would be syphilis. So that the chances are that he has syphilitic aortitis, aortic regurgitation, and left ventricle hypertrophy. He has also, some arteriosclerosis. I would say pulmonary tuberculosis of an acute pneumonic form and syphilitic aortic regurgitation.

Dr. WILLIAM D. SMITH. I think that Dr. King ought to have the comfort of knowing how wrong I was in the diagnosis in this case. I saw this man once and he was desperately sick. I decided he had a marked area of consolidation and an atypical pneumonia. I did not think he had empyema or abscess or infarct. When I saw him his right chest seemed to be flattened and moved much less even up under the clavicle than the left. It may possibly have been the way he was lying. Then his heart

findings were perfectly consistent with a syphilitic aortitis and aortic regurgitation. He had a very free aortic regurgitation and he was a Negro. My impression was very definite that he had a queer pneumonia, that he also had tuberculosis, and that he had the aortic regurgitation of syphilitic aortitis.

#### CLINICAL DIAGNOSES

Aortic regurgitation  
Luetic heart disease?  
Pneumonia

#### DR. DONALD S. KING'S DIAGNOSES

Tuberculous pneumonia  
Syphilitic aortitis with aortic regurgitation

#### ANATOMIC DIAGNOSES

Acute bacterial endocarditis with necrosis and perforation of the anterior cusp of the aortic valve  
Organizing bronchopneumonia  
Septicemia, streptococcus hemolyticus  
Pleuritis, acute fibrinous  
Arteriosclerosis

#### PATHOLOGIC DISCUSSION

Dr. BENJAMIN CASTLEMAN. Unfortunately the patient was in the hospital for only two days. A Hinton test was done but had not been reported at the time of autopsy. A later report was negative. A blood culture was also done but was not reported until after he died. This showed hemolytic streptococcus. He did have a pneumonia in the right upper lobe and an organizing bronchopneumonia. There was no evidence of tuberculosis or lobar pneumonia. There were areas where some alveoli were perfectly normal, while others were involved in an organizing process. The other lobes were not remarkable. The heart was quite unusual. It was slightly hypertrophied, especially on the left, and weighed 425 grams. The anterior cusp on the aortic valve showed an acute ulcerative endocarditis with a perforation of the cusp allowing for an insufficiency and therefore all the signs of syphilitic aortitis with insufficiency. The vegetation on the cusp measured about 1.5 by 1.5 by 1 centimeter and the perforation through the cusp was about 1.5 by 0.4 centimeters in extent. This endocarditis was surprisingly limited to only one cusp and apparently it was associated with a hemolytic streptococcus septicemia secondary to the pneumonia.

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## UNFINISHED BUSINESS

In the issue of this *Journal* of April 9 1936 we published an excerpt from an address made by Dr. Wade H. Frost on the eradication of tuberculosis. Doctor Frost had said "With improved measures of control which are within the limits of practicability including better detection and isolation of open cases, with higher standards of living and personal hygiene there appears to be no fundamental reason why tuberculosis may not be virtually eradicated from large areas in this country. While there are certain contingencies which obviously might bring about a recrudescence after the disease has reached an extremely low level it does not appear that this result is inevitable in accordance with any accepted biological law or that it is especially to be anticipated."

Our readers, who with this statement in mind examined the report on page 751 of the same issue on cases and deaths from reportable diseases in Massachusetts might have had their attention arrested as ours was by the figures

for tuberculosis. For the years 1934 and 1935 all forms of that disease caused approximately as many cases and more deaths than did lobar pneumonia which in morbidity and mortality was second only to tuberculosis among all the reportable diseases. There is much food for thought in the comparison to which we now draw attention.

The voluntary agencies organized throughout the country to combat this disease the local, county and state departments of health all deserve high praise for the enthusiasm energy and ability displayed in the campaigns they have waged and for their notable achievement in reducing sickness and fatality from tuberculosis to the present low level but because of the operation of the law of diminishing returns, continued and increased effort is needed if the goal held out by Doctor Frost is to be attained. The enlistment of wider public interest and support, and more ample governmental appropriations for the discovery and care of the tuberculous must come if the dream is to be made an actuality.

Doctor Frost has told us the way in which the seemingly Utopian state can be reached. First and foremost is the detection and isolation of the open case—the fountain of infection. Higher standards of living in these days of economic distress are difficult to bring to the needy, but the difficulty is not insuperable. The dissemination of knowledge of food values and food costs is being made a powerful weapon against undernourishment, hospitalization of the tuberculous serves a double purpose in converting a potential source of infection into an able-bodied person who within certain limits, can again take his place among the wage earners, and the preventoria for discovering latent or active tuberculosis in children and for building resistance to endogenous or exogenous infection are all parts or amplifications of Doctor Frost's suggested program.

With nearly four thousand cases and over eighteen hundred deaths occurring each year in Massachusetts alone tuberculosis still holds its place on the agenda of the health officer as unfinished business.

## NEUTRON RAYS

It is difficult for anyone to realize that that fundamental presumably indestructible component part of all matter—the atom—has been literally shot into pieces. In experiments conducted at the University of California it has been possible to smash most of the known atoms by bombarding them with deuterons which are the cores of the atoms of deuterium (heavy hydrogen). This dissociation of deuterium has been made possible by the cyclotron devised by Professor Ernest Lawrence. In this machine,

the deuterons are spun and at each revolution receive an electric charge of 50,000 volts. When the cumulative charge has reached 6,000,000 volts, the deuterons cannot be restrained. They leave the machine and the beam so produced is the means of the atomic bombardment. If this beam is directed on beryllium contained in a vacuum tube the atom of beryllium is smashed, resulting in the liberation of neutrons, the most penetrating particles in nature, which have the astonishing energy equivalent of 15,000,000 volts. These neutron rays are approximately fifteen times as strong as those emitted by the most powerful x-ray tubes.

The application of neutron rays to the treatment of malignant disease is suggested and it is of interest to note that Dr. John Lawrence of the Yale University School of Medicine and his brother, Professor Lawrence,\* have reported on the use of such rays in the treatment of transplantable tumors in experimental animals. They point out that the difficulty in treating malignant tumors with x-rays has arisen, chiefly, from the fact that such rays are only about 20 per cent more lethal for malignant cells than for normal body cells. In other words, it is difficult to be sure of killing the malignant cells without seriously damaging the normal cells. In their experiments the neutron rays were found to be 4 times as lethal as x-rays for sarcoma cells, but only 2.7 times as lethal for normal mice. This suggests that the factor of safety is much greater and it is to be hoped that further experimentation will confirm the efficacy of neutron rays in the treatment of malignant tumors.

\*Comparative Biological Effects of Neutron Rays and X Rays  
Presented before the annual meeting of the American Society  
for Clinical Investigation Atlantic City, N. J. May 4, 1935.

### WILL DR. OVERHOLSER BE REAPPOINTED?

THE statement published in the *Boston Herald* of July 11, to the effect that with the expiration of his term of office, Dr. Winfred Overholser, Commissioner of Mental Diseases, will not be reappointed by Governor Curley cannot be regarded with complacency by those who are familiar with the excellent administration of his Department by the present Commissioner.

Dr. Overholser was advanced to the position of Commissioner by former Governor Eliot. The position is one of great importance and has been developed and held by qualified executives. This Department of the Commonwealth stands in a high position among the institutions of this country devoted to the care of those suffering with mental illness.

Dr. Overholser's record is submitted.

He was born in Worcester, Massachusetts, April 21, 1892. Educated in the public schools

of Wellesley, Massachusetts, A. B., cum laude, Harvard College, 1912, M. D., Boston University School of Medicine, 1916. Married Dorothy Stebbins, of Worcester, June 4, 1919, children Dorothy, Jane, and Winfred, Jr., Resident Physician, Evans Memorial Hospital, 1916-17, Assistant Physician, Westborough State Hospital, 1917-18, Lieutenant, Neuro-psychiatric Section of United States Army Medical Corps, 1918-19, Assistant Physician, Westborough State Hospital, 1919-20, Assistant Superintendent, Gardner State Hospital, 1920-21, Assistant Superintendent, Medfield State Hospital, 1921-24, Assistant to Commissioner, Massachusetts Department of Mental Diseases, 1924-25, Director, Division for Examination of Prisoners, Department of Mental Diseases, 1925-30, Assistant Commissioner, Department of Mental Diseases, 1930-34, appointed Commissioner of Mental Diseases in June, 1934. Former President of the Massachusetts Psychiatric Society, Councilor and member of Executive Committee, American Psychiatric Association, Chairman Hospitalization Committee, Department of Massachusetts American Legion, Member, National Rehabilitation Committee of American Legion, State Expert for Examination of Insane Criminals, 1928-33, Former Professor of Psychiatry, Boston University School of Medicine, Lecturer, Boston University School of Law, Chairman Committee on Legal Aspects of Psychiatry of American Psychiatric Association, Committee on Psychiatric Jurisprudence, American Medical Association, Committee on Scientific Administration of the National Committee for Mental Hygiene, Consultant, Medical Aspects of Crime, National Crime Commission, Councilor, American Psychiatric Association, Member Massachusetts Psychiatric Society (Secretary, 1925-1932, Vice-President, 1932-33, President, 1933-34), President of the New England Society of Psychiatry (1936-1937), Appointed Consultant in Psychiatry in the United States Public Health Service on May 16, 1936, effective through June 30, 1937, Massachusetts Chapter American Institute of Criminal Law and Criminology (Secretary, 1925-), Chairman, Committee on Delinquents and Prisons, First International Congress of Mental Hygiene, Executive Committee, Massachusetts State Conference of Social Work, 1932-33, Department Hospitalization Committee of the American Legion, 1922-32, Vice Chairman, Area A of National Rehabilitation Committee, American Legion, 1930-1933, Commander Beckwith Post, Medfield, Massachusetts, 1922-24, Member Executive Committee National Survey of Public Mental Hospitals Service, representing American Psychiatric Association, 1936, Member Committee on Postgraduate Instruction of the Massachusetts Medical Society, 1936, Author of numerous articles in medical

and legal journals on the legal aspects of psychiatry

Residence 22 Clifton Road Wellesley Hills, Massachusetts His club and other associations are testimonials of his standing in the community

We do not enter into any political discussion in connection with the publicity relating to the appointment of the Commissioner of Mental Diseases but we do wish to be recorded in opposition to any changes in any department dealing with public health or the care of unfortunate human beings except with the assurance of an improvement in service Dr Overholser's record warrants his reappointment He is well physically and sound mentally and can give many years of service to the Commonwealth The only reason for the selection of another person to fill the position under discussion is that there is some one better qualified Has he been found?

His Excellency, Governor Curley, has defined the principles which should guide the appointing power in the words employed in his 1935 inaugural address "Under any system elected officials would consider it both a duty and a privilege to retain in office men and women who could actually qualify as career officials"

With the expectation of sincerity on the part of the Governor we cannot believe that there will be any change in the position of Commissioner of Mental Diseases If there is a repudiation of the recorded sentiment quoted above the reputation of Massachusetts will be degraded

### THIS WEEK'S ISSUE

CONTAINS articles by the following named authors

TRUESDALE, P E M D Harvard University Medical School 1898 F A C S Chief Surgeon The Truesdale Hospital and Earle P Charlton Surgery Address 151 Rock Street, Fall River Mass Associated with him is

HYATT, G T M D Harvard University Medical School 1929 Orthopedic Surgeon The Truesdale Hospital Assistant in Orthopedic Surgery, Massachusetts General Hospital Boston Address 151 Rock Street Fall River Mass Their subject is Funnel Chest Page 101

MOORE, MERRILL A B M D Vanderbilt University School of Medicine 1928 Associate in Psychiatry, Harvard University Medical School Address 384 Commonwealth Avenue Boston Mass Associated with him is

MERRITT, H HOUSTON B A M D Johns Hopkins University School of Medicine 1926 Associate in Neurology Harvard University Medical School Assistant Visiting Neurologist

Boston City Hospital Address Boston City Hospital Boston Mass Their subject is Dementia Paralytica at the Boston Psychopathic Hospital Page 108

ELEY, R CANNON M D Medical Department University of Virginia 1925 Associate in Pediatrics and Communicable Diseases, Harvard University Medical School and School of Public Health Associate Visiting Physician Children's Hospital Boston Address 319 Longwood Avenue Boston Mass Associated with him are

VOGT, E C M D State University of Iowa College of Medicine 1923 Instructor in Roentgenology Harvard University Medical School Roentgenologist Children's Hospital Address Children's Hospital Boston Mass And

HENDERSON, MARY G R N Graduate of the Malden Hospital Training School for Nurses 1931, and Simmons School of Public Health 1933 In charge of Child Welfare Brookline Friendly Society Address 10 Walter Avenue Brookline Mass Their subject is The Prophylactic Value of Vitamin D Irradiated and Vitamin D Yeast-Fed Milk Page 110

KILBURN, IRA N M D Dartmouth Medical School 1911 Urologist, Springfield Hospital and the Wesson Memorial Hospital, Springfield Mass Consulting Urologist, Noble Hospital, Westfield Mass, and Mary Lane Hospital, Ware Mass His subject is Tuberculosis of the Urethra, with Report of a Case Page 112 Address 10 Chestnut Street, Springfield, Mass

COSTELLO, HENRY N A B, M D Johns Hopkins University School of Medicine 1910 F A C S Gynecologist, St Francis Hospital Hartford Conn Associate Surgeon St Francis Hospital Hartford Conn Medical Examiner (Coroner's Physician) Hartford Conn President of the Association of Medical Examiners of the State of Connecticut His subject is A Review of Medical Legislation in Connecticut From 1911 to 1935 Page 114 Address 179 Allen Street Hartford Conn

### MISCELLANY

#### THE NOMINATION OF HARRY L STEVENS

The Governor has nominated Dr Harry Lawrence Stevens of 133 Kempton Street New Bedford for consideration by the Council for the position on the Board of Registration in Medicine made vacant by the termination of the term of service of Dr Royal P Watkins of Worcester

Dr Stevens graduated from the Baltimore Medical College in 1891 and has practiced several years in New Bedford He joined the Massachusetts Medical Society in 1891 and again in 1926

Dr Watkins has given loyal service to the state



and has shown a judicial temperament in dealing with the complicated and perplexing problems of this Board. He contributed the knowledge and experience incident to a large surgical practice to the medical duties of the position.

### CONNECTICUT NEWS

#### THE HISTORICAL CHARTER OAK

Dr Charles Coffing Beach octogenarian and venerable practitioner of Hartford on June 16 the anniversary of Thomas Hooker's arrival in Hartford three hundred years ago, presented the City of Hartford with a three foot piece of wood from the original Charter Oak. This chunk includes the side of a knot hole believed to have hidden the Charter in 1687. The fragment of the tree believed to have been 1000 years old when it was blown down in a storm in August 1856, is gnarled and twisted. It has been passed on from one generation to another through the hands of Buckleys, Stuarts and Beaches.

For many years the old oak chunk had been stored in the warehouse of Woodruff and Beach on Commerce Street. Later it was broken in two, one half going to Dr Charles C Beach and one half to his brother. Dr Beach believes the brother's share to have been a portion preserved in the State Library. The piece presented to the city stands encased in a glass cabinet on the back of which is embossed a brief history of the tree. Mayor Speilacy received this gift for the citizens of Hartford and in doing so expressed his appreciation of the action of the Beach family in relinquishing so treasured a relic.

#### HEALTH OFFICER APPOINTED IN HARTFORD

After several months of bitter controversy, the Board of Health of Hartford on June 17 appointed Dr Benjamin G. Horning to the position of health officer in that city. This appointment followed immediately after Mayor Speilacy had submitted Dr Hornings name for consideration. The new appointee has been director of the division of local public health administration of the State Department of Health. Prior to this he held the position of epidemiologist in the Bureau of Preventable Diseases which appointment he received in April 1931.

Dr Horning was born in Oregon September 11 1893 and received his early education in that state. His premedical education at the University of Oregon was interrupted by war service from April 20 1917 to September 27 1919, but he returned to the university after his discharge from the service to graduate and then spent four years on the faculty as an instructor and assistant professor. He received a degree of Master of Science from the University of Oregon. Entering Harvard University School of Medicine in 1924 he received his degree of Doctor of Medicine in 1928. The next two years were spent as an interne at the University of Michigan Hospital Ann Arbor Michigan, after which Dr Horning became resident physician at the King County Hospital Seattle Washington. He came to

Connecticut from Seattle. While at Harvard Dr Horning was granted a Rockefeller Foundation scholarship the first of two which he received. He then received four months of training in public health field work in Alabama. The position to which he has just been appointed carries a yearly salary of \$5750, less a five per cent cut.

Mayor Speilacy emphasized the fact that the Health Department is allowed \$93 000 out of which one third is turned over to the Visiting Nurse Association leaving but \$60 000 for health protection, a sum which he believes entirely insufficient for a city with a population of almost 200,000. At the same meeting of the Board of Health Dr Herbert Bailey was appointed acting epidemiologist to serve during the absence, due to illness of Dr Thomas F. O'Brien.

#### DR A. J. WOLFF, MEDICOLEGAL EXPERT, DIES

A brief account of Dr Wolff's life appeared in the issue of July 2. Other facts of interest appear below.

Always possessed of an adventurous and inquiring spirit, he piloted an airplane for the first time at the age of seventy-seven without any previous instruction. While riding in a plane over Brainard Field he took over the controls for a short time.

Dr Wolff was one of the best known physicians in Connecticut. He retired as municipal bacteriologist in October, 1925, resigned his position at Mt Sinai Hospital after several years of service and his position with St. Francis Hospital about ten years ago.

His maternal ancestors lived in London and Ipswich and the family line is traced back to the thirteenth century. Dr Wolff's grandfather was a construction engineer in the French army under Napoleon I. His father served through the Crimean War in the French Service and was surgeon of the Fifty-Fifth Regiment New York Volunteers a French Regiment in the Civil War.

Dr Wolff was educated at the Plattsburgh, N. Y. High School and at fifteen began the study of medicine with his father. This he continued for seven years. At the end of that time he obtained a license to practice in New York. Later he moved to Texas with his father. While practicing medicine at Galveston Dr Wolff became assistant surgeon at the United States Army Post at Fort Brown. From 1877 to 1881 he had all sorts of service along the Rio Grande. General George Sykes was his commander and the young physician attended the general at the time of his death. During this time Dr Wolff took the opportunity to study the southern climate and its peculiar diseases.

In 1883 he came to Hartford, and lived here until his death. In his medicolegal capacity he was associated with such famous cases as that of Amy Archer Gilligan in Windsor, the famous Buchanan case in New York, the Green's Farm murder at Middletown, the case of Mrs. Schan in New Jersey, the Souder, Dalv, Rogers, Trebbe and Bestero cases.

With Dr Chas P Botsford he had a leading part in establishing in 1894 the municipal laboratory and as city bacteriologist did much to decrease the mortality rate from such contagious diseases as diphtheria tuberculosis and typhoid Dr Wolff had a well-equipped laboratory also at his home on North Beacon Street. He was a member of the city county and state medical societies of the Royal Microscopic Society of London and of the Kings County Medical Society in New York.

#### AMERICAN LIFE CONVENTION HONORS

##### DR DONALD B CRAGIN

Dr Donald B Cragin of 1414 Asylum Avenue has just been elected chairman of the medical section of the American Life Convention. Medical director of the Aetna Life Insurance Company since 1933 Dr Cragin is active in numerous national organizations dealing with the medical phases of life insurance underwriting. Chairmanship of the American Life Convention's medical section is one of the profession's major assignments since the Convention membership is comprised of the medical directors of practically all leading life insurance companies. Dr Cragin has lived in Hartford since 1920 and has been president of the City Board of Health. He is at present a consulting surgeon on the staff of the Hartford Hospital vice-president of the Hartford Dispensary and an active member of the Hartford Medical Society. He joined the Aetna Life Insurance Company February 1 1934 as an associate medical director.

Dr Egbert Morrill Andrews formerly an interne at the Hartford Hospital and now pursuing special work in surgery at Baltimore Maryland was married in Hartford on June 10 1936 to Miss Barbara Ellen Stevens. Miss Stevens is a graduate of the Hartford Hospital Training School for Nurses and for several years has been a member of the nursing staff of the Hartford Hospital.

Dr Henry Perkins Hopkins formerly an interne at the Hartford Hospital and now engaged in general practice at Chatham Massachusetts was married in Hartford on June 18 1936 to Miss Violet Kathleen Quackenbush. Miss Quackenbush is a graduate of the Hartford Hospital Training School for Nurses and for the past few years has been an anesthetist at the Hartford Hospital.

Dr Hilda C Crosby daughter of Mr and Mrs Albert H Crosby of Oxford Street was married to Dr E Miles Standish son of Mr and Mrs Jared B Standish of Hartford Avenue Wethersfield Thursday afternoon June 25 1936 at four o'clock at the Farmington Country Club. Bishop Welch of Shanghai China officiated.

The bride was given in marriage by her father and was attended by Mrs A Ashley Weech of New York as matron of honor and by her sister Miss Eleanor H Crosby as maid of honor. The bridesmaids were Mrs James Standish sister-in-law of

the bridegroom and Dr A Parks McCombs of New York. Abby Richmond and Cynthia Richmond nieces of the bridegroom were flower girls. Mr Robert R Robertson of New York was best man and the ushers were Dr Robert Buol of New Britain and Mr Paul Standish and Mr James Standish brothers of the bridegroom. Following a reception Dr and Mrs Standish left for a wedding trip to Mexico and Guatemala.

The bride is a graduate of Wellesley College and of Cornell Medical College. Dr Standish is a graduate of Wesleyan University where he was a member of Beta Theta Pi and of the Harvard University Medical School, where he was a member of Nu Sigma Nu Fraternity. He is a dermatologist with an office at 179 Allen Street Hartford Conn.

#### CHANGES IN INTERNES AT HARTFORD HOSPITAL

Recently the Hartford Hospital has lengthened its rotating interne service to two years. On July 1 1936 twelve new men began their duties at the hospital. It is interesting to note that three of these new internes are Hartford men and one is the son of Dr Edward H Truex a prominent ophthalmologist and otolaryngologist in Hartford.

The list of new internes and their medical schools is as follows:

Edward H Truex Jr Harvard University Medical School

Arthur D Baldwin Harvard University Medical School

Ralph E Durkee Jr Harvard University Medical School

John C Shull Harvard University Medical School

Edward Warren Oxnard Harvard University Medical School

A Burton Anderson Harvard University Medical School

George H Brown Yale University School of Medicine

Roy C Robinson Yale University School of Medicine

Walter William Fischer Columbia University College of Physicians and Surgeons

Burr H. Curtis Columbia University College of Physicians and Surgeons

DeHart Krans Cornell University Medical College

William D Monahan McGill University Faculty of Medicine

The following internes have completed their period of service:

Leroy H Wardner Plans to study abroad for several months and then engage in practice at Saranac Lake New York.

William H Goodson Jr Contemplates returning to his home at Liberty Missouri to engage in practice with his father.

Burwell Dodd Goes to Union Memorial Hospital Baltimore Maryland to specialize in surgery.

Philip M Cornwell Takes up general practice in East Hartford Connecticut.

Wayne P Bryor Hampton New Hampshire is to receive him as its youngest general practitioner  
 Gilbert W Heuhlein Plans to pursue special work in Roentgenology at Boston and Philadelphia  
 E Allen McLean Goes to Boston City Hospital for further work in Obstetrics and Gynecology  
 Donald M Beckwith Goes to Providence Lying In Hospital for further work in Obstetrics  
 James E Bouvaird Plans to practice in Massachusetts  
 Kenneth E Quickel Plans to return to Pennsylvania to practice  
 S Paul Coates Plans to practice somewhere in Maryland  
 Philip Partington Has already established himself in General Practice at Great Barrington Mass

## CORRESPONDENCE

### A BETTER WORKMENS COMPENSATION LAW

July 1 1936

Editor *New England Journal of Medicine*

There was enacted a year ago in the State of New York a bill to remedy the inequality of the Workmens Compensation Act as it referred to medical men

Prior to the enactment of this 'O'Brien Kalowski Bill' conditions in the State of New York were quite similar to those that now obtain in Massachusetts. A few doctors with the aid of trained nurses were doing practically all the compensation work.

The Medical Society of New York in conjunction with labor organizations engineered this model bill through the legislature. As a result the medical profession as a whole has been tremendously benefited.

When a man is injured in a factory or elsewhere in Boston the foreman or owner directs the injured person to go to the insurance clinic for treatment. It is true that the man can object and go to his family doctor but few workmen know that they can do that, and in the great majority of cases the man is afraid to lose his position if he opposes the wish of the man in charge.

This New York law changes the procedure. The injured man himself selects the physician from a panel that is posted in all establishments where labor is employed.

Why can we not have a law like this in Massachusetts?

CHARLES MALONE M.D.

46 St John Street  
 Jamaica Plain, Mass

### DR HAROLD HAYS BECOMES DIRECTOR GENERAL OF THE AMERICAN MEDICAL EDITORS AND AUTHORS ASSOCIATION

June 29 1936

Editor *New England Journal of Medicine*,

An important change is taking place in the Association and we would appreciate publication of the following in the next issue of your *Journal*.

Because of the many outside duties which Dr

Hunt has found it imperative to attend to he felt that it was necessary for him to relinquish the Director Generalship of the American Medical Editors and Authors Association. He also felt that he had laid the groundwork and that, perhaps, some new blood might encourage the activities of the Association. After conference with the Officers and Executive Council Dr Harold Hays was requested to take the position of Director General. He has agreed to assume this responsibility for the time being. It is therefore with pleasure that we announce that Dr Harold Hays of New York City who has contributed a great deal to medical literature and has been Associate Editor on a number of medical journals will assume the office of Director-General on August 1. Dr Hays has agreed to co-operate in this capacity for this year at least and we feel that with his active ideas and imagination he will be able to create a great deal of enthusiasm for the Association. We know that it is his intention to write to all the members requesting them to give their opinion about the Association and asking them for suggestions for the betterment of our work. We sincerely hope that all the members will actively co-operate and that we shall see results even more eminently successful at the end of another year.

With thanks for your courtesy,

Most cordially yours,

L. A. SHERMAN, Secretary

4 East 66th Street  
 New York, N. Y.

### ANSWER TO DR CHANNING FROTHINGHAM'S LETTER HAVE THE PRACTITIONERS AWAKENED?

June 27, 1936

Editor *New England Journal of Medicine*,

I personally have a great deal of respect for Dr Channing Frothingham who is our present Vice-President of the Massachusetts Medical Society. He has impressed me as being a bright man after listening to him at the Faulkner Hospital. Anything he may say is sincere. In spite of his good qualities I am forced to comment on his remarks as printed in *The New England Journal of Medicine*, June 29, 1936.

Can the chairman of the Committee on Public Health definitely point out that the physicians who have agreed to do vaccination and immunization did refuse any patient who applied to them? If only 10 per cent of the babies who were or are suitable for this work have been protected is it the fault of the physicians? The fault must be elsewhere. Do you mean to convey to the physicians, that 90 per cent of the children are still to be immunized by the practicing physicians and that they are derelict in their duties? Such a situation is absolutely untrue. Let those children be brought to the physicians and they will do their duty. If as you stated, the Public Health Officials are co-operating with the physicians where are the patients? Many of my fellow practitioners including myself didn't see even one patient. They are ready, able and willing to vac-

ciate and immunize any and all who may come. Instead of indirectly blaming the physicians it seems to me, if the cause could be found, the physicians would be thankful. Don't blame the physicians.

BERNARD ZUCKERMAN M.D.

978 Blue Hill Avenue  
Dorchester Mass

COMMENT ON DR ZUCKERMAN'S LETTER

July 3 1936

Editor *New England Journal of Medicine*,

In the letter referred to above by Dr Zuckerman no implication that the practitioners are unwilling to do immunization work was intended. The awakening of the practitioners to their duties in the problems of preventive medicine is however important. The practitioners as well as the health officer should be an active force in the education of the people. In order to avoid the possibility of practitioners being accused of unethical procedures in urging immunization upon their patients, the Council of the Massachusetts Medical Society at its February meeting in 1936 approved of a statement regarding immunization which could be presented to parents and others by practitioners, hospitals and so forth. This statement appears on page 524 of this issue of *The New England Journal of Medicine* of March 12 1936. It is hoped that the practitioner will increase their activities along these educational lines so that more than 10 per cent of the children will seek immunization and will have it done by their private physicians rather than the public health officials.

CHANNING FROTHINGHAM M.D.

1153 Centre Street  
Jamaica Plain Mass

GO YE AND DO LIKEWISE!

Editor *New England Journal of Medicine*

*The Boston Herald* in an editorial of October 31 1935 reported that the Church Pension Fund of the Protestant Episcopal church now has assets of about \$30 000 000. Nearly 1900 retired clergymen and widows and orphans of clergymen are now receiving an average allowance of \$946.00 a year. During the last five years it has been the savior and defender of many a home and family.

And in contrast let us consider the conditions prevailing in our own profession. We count about one hundred and sixty five thousand physicians in the United States of America. One hundred thousand of them are actively welded together in one great organization—The American Medical Association. Yet a number of old colleagues are yearly consigned to the economic scrap heap through the infirmities of old age the hazards of their work or life's vicissitudes in general. A small number have lately been given meager aid from the common charity chest of our benevolent federal administration in many instances after they had surrendered their self respect. Many when dead must often

be sent to their last resting places on the contributions collected from among the colleagues of their local medical society; their widows are then left financially destitute, and soon entirely forgotten. How often does one meet an old colleague out on a call in the dead of a wintry night in order to earn a paltry fee (if paid!) whereby to keep body and soul together? Not for him to spend the last few years of a hard and unselfish life in rest and comparative ease! Not for him the comforting thought that the dear ones he leaves behind will be taken care of! Not a ray of hope till death seals his miserv.

Yet there are one hundred and sixty five thousand of us ever charitable to our patients to our hospitals to everybody everybody but ourselves. One is often forced to wonder if charity should not begin at home even though in a small degree? Aren't we all in a measure, to blame for conditions existing in our medical practice conditions that bring some of us to the brink of financial ruin with the advent of old age? Aren't we all then, responsible for our old, feeble and indigent colleagues? And if so is there nothing we can do to ease the lot of the poor members of our profession? If the Episcopal Church can do it for its clergy, why can't we? Let us see then, if we as mature men and women of a great profession cannot be of some help to our old and suffering colleagues or their dependents.

Suppose we establish an Old Age Physicians Retirement Fund with only willing members participating by contributing \$10 a year. There ought to be about one hundred thousand physicians charitable enough and with vision to consider the wisdom and necessity of such a fund. This then ought to bring in a round million dollars every year. In the course of a short time ten years for instance this would result in a large sum of money.

Secondly there are members in our profession who are so fortunate as to count their income in many thousands of dollars and there are others who can even claim ownership to large fortunes. There are also some whose minds are taxed as to where best to bequeath part of their worldly possessions. What a privilege it would be for all such rich colleagues to have this excellent chance to contribute to this worthy cause!

Then again let us consider some of our grateful patients. I mean some of those that not only pay their doctors but often build hospitals or additions thereto in appreciation of the Aesculapian art. An Old Age Physicians Retirement Fund would be an excellent outlet for them to express their appreciation by generous contributions. Anyone can see how fast a fund of this kind would grow. Why Jack's beanstalk would be dwarfed by its rapid sprint!

And now for the beneficiaries of said fund. Say at the age of sixty or thereabouts a colleague for one reason or another would like to retire. If only he could be assured of an income between \$1200 and \$2000 depending on the number of dependents all he would have to do is to apply to the Retirement

Fund through his local society. He would then surrender his license to practice and give a fitting assurance that he would not engage in any competitive or remunerative medical activities. Such an arrangement would not only give the retired member a respectable income and deserved rest but would also immediately create an opening for a new member seeking a location, and in this way benefit the younger doctors—whose position at present is indeed precarious, to say the least.

An argument has been advanced, that for an old age retirement fund to be self-sufficient, it must be compulsory upon all members of an organization—and the premiums must be paid in accordance with existing rates for old age annuities. However this is only true with organizations where retirement is mandatory at a certain age and where every retiring member is given an annuity regardless of whether he is in need of it, as is the case with our postal and other government employees. It is easy to see, that it would be different in our case. No one need retire at any age whatever, except when so desired for good and sufficient cause, neither would benefits be given to such retiring members as may have been fortunate enough to have other and sufficient sources of income. Most of our physicians are able to carry on their practices satisfactorily to a ripe old age. They would only scoff at an idea of compulsory retirement, at the same time, they would be glad to contribute to a retirement fund, because of the knowledge of the plan, and because of their intimacy with the needy colleagues. On the other hand our younger men, in addition to a feeling of sympathy for such a project, would also support it because of the greater opportunities for themselves.

All we need then is for some large individual society to start an active movement for the establishment of such An Old Age Physicians' Retirement Fund and blot out the present shame. If medicine is to survive as an honorable profession, let us keep it honorable by caring for our old and needy colleagues!

R. GURALNICK, M.D.

256 Bennington Street  
East Boston, Mass.

## RECENT DEATHS

**STILES**—PERCY GOLDTHWAIT STILES, aged sixty-one years, died July 5, 1936, at his home, 15 Page Road, Newtonville, Massachusetts, after a comparatively brief illness.

Dr. Stiles was born in Newtonville and after preparation for advanced study entered the Massachusetts Institute of Technology and received his S.B. degree in 1897. In 1902 Johns Hopkins University conferred the Ph.D. degree in Physiology.

Dr. Stiles' life was devoted to teaching and the positions held by him were the following:

Instructor in Physiology, Bellevue Medical School, 1902-03

Instructor in Physiology, Massachusetts Institute of Technology, 1903-17

Instructor in Physiology, Simmons College, 1904-07

Instructor in Physiology, Boston School of Physical Education, 1914-20

Assistant Professor, Simmons College, 1907-14

Faculty Instructor in Physiology, Harvard Medical School, 1913-16

Assistant Professor in Physiology, Harvard Medical School, 1916-36

Dr. Stiles was Assistant Editor of Biological Abstracts from 1929-1936 and was a member of the Physiological Society, the American Academy of Arts and Sciences, and the Society of Experimental Biology and Medicine.

The following publications were produced by him:

Nutritional Physiology, 1912

The Nervous System and Its Conservation, 1914

Human Physiology (Text), 1917 (5th ed., 1923)

Wayfaring in New England, 1920

Dreams, 1927

In addition, many contributions in scientific journals were written by Dr. Stiles.

Two of Dr. Stiles' hobbies are reflected in the titles of the last two publications. As a lover of nature he delighted to tramp through the byways of New England. For many years he collected and recorded his dreams, and his volume of 1927 forms an interesting and illuminating collection of dream material. Always a modest and retiring individual, he was best appreciated by his students of physiology with whom he came in close contact. His lucid style of exposition and apt use of similes made his lectures in physiology a delight to his students.

Two children, Edmund K. Stiles and Esther H. Stiles, survive him.

**BULLOCK**—EDWIN WARREN BULLOCK, M.D., of 15 Summit Avenue, Somerville, Massachusetts, a retired physician, died July 7, 1936. Dr. Bullock was born in Wellesley in 1863, and graduated from the Harvard University Medical School in 1886.

He was a Fellow of the Massachusetts Medical Society and the American Medical Association.

Two daughters, Mrs. Alice B. Howe and Mrs. Ann Burrill, survive him.

## NOTICE

### REMOVAL

FRANCIS B. MCCLINTOCK, M.D., announces the removal of his office to 39 Nichols Street, Chelsea. Telephone Chelsea 0144.

## REPORT OF MEETING

### PETER BENT BRIGHAM HOSPITAL LECTURE

The second lecture by Dr. K. H. Giertz, Surgeon in Chief pro tempore in the Peter Bent Brigham

Hospital was given there on May 20 1936 on the subject "Thrombo-Embolic Disease and Its Surgical Treatment"

Interest in pulmonary embolism has been renewed because it has become an increasingly frequent complication and because a hopeful operative procedure now possible has been credited with ten definite recoveries in over five hundred cases. Even in the cases which do not end fatally, the loss of earning power during the prolonged convalescence gives an important social aspect to the disease.

Although thrombi may be formed anywhere in the venous system the commonest sites are the inferior vena cava and its tributaries the femoral iliac and hypogastric veins. The thrombus is of a mixed type, formed of platelets, leucocytes, and fibrin and often appears as a 'distant thrombus' remote from the operative site, so that direct trauma to the veins can be ruled out. Nevertheless operations on the rectum prostate and female genital tract have a strikingly high incidence of thrombo-embolism. It is likely that there occurs among medical patients and nonhospitalized patients a great deal more thrombo-embolic disease than is commonly recognized.

The presence of certain constitutional signs suggests perhaps a specific infection. Virtual epidemics may occur in hospitals and a certain seasonal incidence has been noted. Although attention has been paid to changes in the composition of the blood in the condition of the endotoxemia and the vessels, and in the behavior of the circulation nothing significant has yet been demonstrated. Among the more important predisposing factors may be listed a number of things. Surgical cases even when the operation has been aseptic result in thrombo-embolism twice as often as other cases. It is very rare below the age of twenty but increases very rapidly in the older age groups and is at a maximum in the fifth and sixth decades. Obese individuals appear more susceptible than lean. This may have some correlation with the age distribution. Cardiac and vascular disease, with its accompanying circulatory changes, may be important. The data collected by Dr. Giertz in Stockholm minimize the rôle of varicose veins which have often been blamed. Prolonged rest in bed is a doubtful cause, and the worth of massage and exercise as prophylaxis is difficult to evaluate.

The disease commonest following abdominal operations, occurs in the order of decreasing frequency after surgery on the legs thorax arms and head and neck being almost unknown in the eye and ear cases. Because of the heavy liability imposed by age operations should be done on elderly people only for good indications and then not until the patient has been brought into the best possible condition.

The thrombus forms in the abdominal veins dries out and breaks off as an eel-shaped embolus perhaps as much as 60 cm long. The old tough eel-like clot lodges at the bifurcation of the pul-

monary artery and may be removed surgically but a fresh friable one breaks up in passing through the heart and produces multiple embolism in the pulmonary arteries of the second and third orders for which operation is futile. Embolism usually occurs in the middle of the second week and the rôle of trauma in loosening the thrombus is questionable for it often occurs in a patient lying quietly in bed.

Thrombosis in the abdominal vessels may be latent or manifest and either sort may give pulmonary embolism. The signs and symptoms of non-obstructing pulmonary embolism are well known. The classical picture of an obstructing embolus is the patient with normal heart, lungs, and kidneys who, on the fourth to the fourteenth postoperative day suddenly develops pain in the chest but rarely near the heart, and rapid, labored breathing, with pallor succeeded by cyanosis. Collapse and shock follow abruptly, with a low arterial pressure but a high and increasing venous pressure from obstruction beyond the right side of the heart. The patient develops a sudden fever and perspires freely. Certain individuals have described subjective symptoms involving the abdominal viscera such as a desire to urinate or defecate, which are probably associated with an obstruction to the venous return as the embolus passes. In animal experiments, whose results check well with clinical observations no cardiac embarrassment developed until two-thirds of the pulmonary artery was occluded. In only a few cases is death instantaneous so that there usually is time for an operation. The question of reflex death from embolism is not settled but appears unlikely in most instances.

The sudden onset in a patient who had previously been making good progress is characteristic and invariable. The initial marked pallor is soon followed by lividity and cyanosis from the venous stasis. The pulse is rapid and feeble and the blood pressure which at first is zero may return to normal and then gradually begin to fall again. This latter phenomenon is a definite indication for surgical interference. Unconsciousness almost invariably occurs for a matter of seconds to hours those who recover are apt to have an amnesia for some time after the attack. The obstruction to the outflow of the right ventricle leads to a rapid dilatation of the pulmonary artery and the right heart, which may be demonstrable on physical examination as a progressing right border of dullness. The prognosis is somewhat better if this is not found.

Immediate operation is demanded if the patient is to be saved. From animal experiments it was found that a tourniquet may be kept on the great vessels for forty-five seconds and that an extra pleural approach was possible. No anesthesia is required so long as the patient remains unconscious. A T-shaped incision with the crossbar of the T parallel to the sternum is made to the left of the sternum, the second third and fourth ribs are resected temporarily and the pericardium is exposed and opened. The pulmonary artery is identified and a tourniquet passed around it, the adventitia is divided by

a 3 cm incision in the long axis of the vessel, and the muscular and intimal coats by a 1.5 cm incision in the same direction. The embolus is secured, usually in several pieces, by repeated fishings with the Trendelenburg forceps or a hook and the incision sutured. If the heart has stopped adrenalin is injected. If this fails, the heart is massaged until regular ventricular contractions are reestablished. The pericardium is then closed and the ribs replaced. It has been observed that the heart may beat spontaneously after having been quiet for twenty minutes, and that spontaneous respirations may be resumed after fifty minutes.

Should the patient recover from this operation he still may die of paradoxical embolism or of the sepsis of the primary disease. Since several patients have recently been observed to die of epileptiform seizures a number of hours after the operation it is believed that irreversible brain damage to the motor area and the corpus striatum was produced in the period of ischemia following the pulmonary embolism.

### SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

#### CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, JULY 20 1936

##### Tuesday, July 21—

\*12 m South End Medical Club Prendergast Pre-ventorium 1000 Harvard Street Mattapan

##### Wednesday, July 22—

†12 m Clinico-Pathological Conference Children's Hospital

##### Saturday, July 25—

\*10 a m - 12 m Staff Rounds at the Peter Bent Brigham Hospital Conducted by Dr Samuel A. Levine

\*Open to the medical profession

†Open to Fellows of the Massachusetts Medical Society

July 21—South End Medical Club Prendergast Pre-ventorium 1000 Harvard Street Mattapan at 12 noon

August 24 29—Harvard University Tercentenary Celebration See page 1166 issue of June 4

September 1936—First International Congress of Sanatoria and Private Nursing Homes See page 803 issue of April 16

September 7 10—International Union against Tuberculosis See page 554 issue of March 12

September 7 11—American Congress of Physical Therapy will meet at the Waldorf-Astoria New York City See page 52 issue of July 2

September 14 and 15—Tercentenary Session of the Harvard Medical School See page 1166 issue of June 4

October 12 18—Third International Congress on Malaria See page 1076 issue of May 21

October 19 23—Clinical Congress of the American College of Surgeons See page 180 issue of January 23

October 19 31—1936 Graduate Fortnight of the New York Academy of Medicine See page 1221, issue of June 11

October 20 22—Academy of Physical Medicine Annual Meeting Hotel Statler Boston

October 20 23—The American Public Health Association See page 1226 issue of June 11

March 30 April 2, 1937—First International Conference on Fever Therapy Postponement notice See page 52 issue of July 2

April 21 24 1937—American Society for Experimental Pathology See page 1075 issue of May 21

## BOOK REVIEWS

**Psychology of Sex** A Manual for Students Havelock Ellis 377 pp New York Emerson Books Inc \$3.00

This is a book which we can unqualifiedly recommend for the use of medical students and practitioners who wish a concise and relatively simple account of this most important subject.

A list of the chapters will give an idea as to the scope of the book. The Biology of Sex The Sexual Impulse in Youth Sexual Deviation and the Erotic Symbolisms Homosexuality Marriage The Art of Love.

For some reason our medical schools have been more backward in teaching the problems of sex and their relation to the practice of medicine than in any other field. The public rightly turns to our profession for guidance in these matters and yet how few doctors are prepared to give worthwhile advice on them. It is not a lack of interest on the part of the student which is responsible for this but rather a persistence of an attitude inherited from past generations.

Here is a book written without bias discussing all the problems having to do with sex in sufficient detail for the needs of the average practitioner. To each chapter there is appended a bibliography of English works for further reading and study by those interested. It seems to us that every doctor would benefit from a careful reading of this book.

**International Clinics** Volume I Forty Sixth Series, 1936 Edited by Louis Hamman 314 pp Philadelphia Montreal, London J B Lippincott Company

This volume is made up of heterogeneous articles of great interest and originality and should prove of interest to the internist, surgeon and general practitioner. These clinics are proving themselves one of the best of medical publications.

**Studies from The Rockefeller Institute for Medical Research** Reprints Volume 96 595 pp New York The Rockefeller Institute for Medical Research

This volume contains a large proportion of work from the Department of the Hospital. Further progress in the study of influenza and of Type I anti pneumococcus serum particularly the purification of the antibodies is reported.

Of special interest from the Department of the Laboratories is the report by Lindbergh on the method of culture of whole organs which received considerable publicity in the lay press some months ago. The basic principle of the method is a pulsating circulation maintained by a three-chambered perfusion pump.



# The New England Journal of Medicine

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## RELIEF OF SEVERE ANGINA PECTORIS IN YOUNG PEOPLE WITH RHEUMATIC HEART DISEASE\*

With Remarks On An Atypical Anginal Syndrome

BY EDWARD F. BLAND, M.D.<sup>†</sup> AND JAMES C. WHITE, M.D.<sup>‡</sup>

IT is our purpose in the present report to call attention to a special group of young people with rheumatic heart disease and disabling angina pectoris who have had a striking relief of pain following sympathetic nerve block. Certain atypical features of the anginal syndrome in this special group resemble closely a syndrome previously observed by others but fully described by Lewis in the St. Croix Lecture in 1931.<sup>1</sup>

The method employed has been the one originally devised by Mandl<sup>2</sup> and modified by Sweetlow<sup>3</sup> whereby painful impulses from the heart and great vessels are blocked by the paravertebral injection with novocain and 95 per cent alcohol of the sympathetic rami communicantes corresponding to the peripheral distribution of the spinal nerves in the painful area. The technique and limitations of the procedure have been fully described recently by one of us (J. C. W.).<sup>4</sup> In general this form of therapy in experienced hands has given satisfactory results. At the Massachusetts General Hospital of thirty-two patients with intractable angina pectoris secondary to arteriosclerotic coronary disease of the heart, the majority (twenty patients) have been completely relieved of pain on the injected side, an additional ten were partially relieved in that their angina has been reduced from a severe form to mild and infrequent attacks easily controlled by nitroglycerin. Only two failed to secure relief and these occurred in the first half of the series. Furthermore we have had successful results in three additional patients with cardiovascular lues and intolerable pain secondary to an expanding aneurysm of the aortic arch. There remains however in addition to the incompletely relieved instances a further limitation to the method, namely the frequent and at times troublesome but temporary complication of postoperative intercostal neuralgia. Rarely (in three cases) this neuralgic pain has been severe and

equal to the pain of angina pectoris for which the procedure was undertaken.

In contrast to these limitations which have been encountered in the arteriosclerotic group of patients our experience with this form of therapy in a small series of young people with angina pectoris secondary to rheumatic heart disease has emphasized two important features, the relief of the anginal pain in the area supplied by the injected nerves has been uniformly successful, and there has been an absence of postoperative intercostal neuralgia. Their case histories are briefly summarized in this report. They reveal atypical features of the anginal syndrome characteristic of this special group and emphasize the rôle of active rheumatism as an important precipitating factor.

### CASE REPORTS

CASE 1 (H. G. S. No. 6075) C. J. a boy seventeen years of age was under observation from 1930 to a few weeks before his death in 1935. He had severe rheumatic heart disease with marked cardiac enlargement, free aortic regurgitation with a blood pressure of 150 mm. of mercury systolic and 30 mm. of mercury diastolic mitral regurgitation and stenosis and angina pectoris decubitus. Rheumatic fever began in 1929 at the age of eleven, and except for brief intervals of one to two months at home or in foster homes the remainder of his six years of life was spent in hospitals. His illness was characterized throughout by persistently active rheumatic disease with frequent severe exacerbations. In January 1934 after a number of weeks of aching precordial pain and during an exacerbation of rheumatic fever he began to have unusual attacks of angina pectoris. The most severe attacks occurred at night. To Dr. B. F. Massell the resident physician we are largely indebted for the blood pressure determinations during the severe nocturnal episodes. The patient was usually awakened in the early morning by a sense of smothering and constriction across the chest and thumping of his heart. The rate was usually 120 to 140 per minute during such attacks. As the heart action became more forceful the oppression increased and was in large measure replaced by severe precordial pain which spread transversely to both sides of the sternum and up the left side of the neck as far as the occipital region. In later attacks there was radiation down the inner aspects of both arms as far as the elbows and rarely to the wrists. During the attack the patient appeared to hold his breath in fear of pain when he breathed there was no true dyspnea during the earlier episodes. Later however dyspnea was a troublesome feature and

From the Massachusetts General Hospital and the House of the Good Samaritan, Boston, Massachusetts. Studies at the latter institution are financed by the Commonwealth Fund.  
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<sup>‡</sup>White, James C.—Assistant Professor of Surgery, Harvard University Medical School, Assistant Visiting Surgeon, Massachusetts General Hospital. For records and addresses of authors see "This Week's Issue" page 169.

pulmonary edema occurred toward the end of several of the severe attacks. There was a generalized flushing of the skin and profuse sweating. The blood pressure was repeatedly observed at the height of an attack to be from 250 to 300 mm of mercury systolic and the diastolic level, although unattainable with any degree of accuracy appeared to be in the vicinity of 10 to 20 mm. Diffuse abdominal pain at times severe and maximal across the upper abdomen was a frequent accompaniment. Nitroglycerin gave relief of the chest pain during the milder attacks but with the severe episodes the relief was so transient that morphia was usually required. Because of increasing severity and frequency of the attacks the first four thoracic sympathetic rami communicantes of the left side were injected with alcohol in April, 1935. A well marked Horner's syndrome together with the peripheral vascular signs of sympathetic nerve block resulted. A small and transient pneumothorax at the left apex and pleural pain for a few hours were the only complications. There was complete and permanent relief of the left-sided chest pain which had previously been maximal in the precordial region. During frequent subsequent attacks severe right-sided pain associated with minimal discomfort in the left neck and below the lower left costal margin persisted. The milder episodes continued to be relieved by nitroglycerin but because of the continued severity of symptoms the upper four sympathetic rami on the right side were injected similarly in May 1935. This was followed by relief of the right-sided discomfort. The paroxysmal circulatory phenomena and the discomfort in the left side of the neck continued, but the important element of fear of an impending attack had been dispelled. With subsequent improvement in his general condition during the next three months he was able to be up and around the house with only occasional anginal attacks largely related to exertion or exertion and manifested by minimal discomfort in the left side of his neck and palpitation. The neck pain promptly responded to nitroglycerin. The patient died in November 1935 several days after the onset of a severe recrudescence of rheumatic fever and seven months after the alcohol injections. His terminal symptoms were those of severe abdominal pain and dyspnea as associated with congestive failure. The autopsy showed chronic rheumatic heart disease with gross scarring and deformity of the aortic, mitral and tricuspid valves together with a thick and adherent pericardium. The heart weighed 1120 grams. The coronary arteries were widely patent throughout. The relief of the intractable pain of angina pectoris in this patient had been complete in the distribution of the nerves injected except for minimal discomfort in the left side of his neck. This residual pain was consistent with x-ray evidence after lipiodol injection that the first thoracic nerve root on this side had been incompletely injected. Although the associated circulatory disturbances were apparently unaffected by the procedure the relief of pain and the elimination of fear not only contributed considerably to his comfort but also may have been an important factor in his subsequent temporary improvement.

CASE 2 (H. G. S. No. 3942) E. C. a female twenty-six years of age has been under observation since 1925. She has rheumatic heart disease with marked cardiac enlargement, free aortic regurgitation with a blood pressure of 170 mm of mercury systolic and 50 mm diastolic, mitral stenosis and regurgitation and angina pectoris decubitus. Severe rheumatic fever and heart disease began at the age of nine years. A recrudescence of rheumatic fever

occurred at the age of sixteen requiring hospitalization for twelve months. She subsequently did well and remained free of symptoms except for moderate exertional dyspnea and palpitation until December 1933 when, at the age of twenty-six, she re-entered the hospital with another recrudescence of rheumatic fever. While at rest in bed she began to have severe angina pectoris. Her attacks were characterized by paroxysmal discomfort due both to pain and to associated circulatory phenomena. The sequence of events began with consciousness of forceful regular heart action and a sense of throbbing in the throat accompanied by an increase in the pulse rate from a resting level of 90 up to 130 to 140 per minute. In one to two minutes an aching precordial pain appeared, rapidly becoming severe and spreading upward in the chest and down the left arm as far as the wrist. Respiratory discomfort and a sense of choking were usually present as well as profuse sweating and generalized flushing of the skin. A blood pressure determination was not made during an attack. Occasionally dyspnea and palpitation occurred without pain, but never the reverse. Although precipitated by emotion or exertion, the attacks most frequently occurred without provocation especially during the night. The severe anginal pain was usually superimposed upon a less intense precordial aching sensation similar to that frequently described by patients during active rheumatic fever. Nitroglycerin gave partial relief, but it was this latter component of the patient's discomfort which remained uninfluenced by the drug and for which morphia was required frequently. In May 1934 the first four thoracic sympathetic rami communicantes on the left side were injected with alcohol. There resulted a well marked Horner's syndrome, a transient partial anesthesia over the left chest anteriorly and a variable paresthesia over the left upper back and down the inner aspect of the left arm. This was followed by complete relief from the anginal pain during frequent subsequent attacks the presence of which was made known by a tightening sensation in the throat and a persistence of the accompanying palpitation, respiratory discomfort, and generalized flushing of the skin. However as with the previous patient, another important element in addition to the pain had been dispelled, namely the fear of an impending attack. It is of considerable interest that the precordial ache which previously had not responded to nitroglycerin persisted off and on in a modified form but on the whole was less severe and less frequent. This component appeared to be directly related to the active rheumatic disease and subsequently entirely disappeared. The patient has been seen at frequent intervals and was last examined in June 1936 two years after the injection. She is in good condition and is free of clinical and laboratory evidence of active rheumatic infection. There remains a slight residual Horner's syndrome and a vague sense of numbness to touch over the precordial area with slight paresthesia along the inner aspect of the left upper arm. She leads a quiet life and is able to do light household work. About once a week she has to pause for a few minutes because of tightening in the throat and thumping of her heart but now always related to unusual exertion or excitement.

CASE 3 (M. G. H. No. 342782) M. S. a female thirty-seven years of age was seen for the first time in the Cardiac Clinic in July 1934. She had severe rheumatic heart disease and marked cardiac enlargement, free aortic regurgitation with a blood pressure of 170 mm of mercury systolic and 40 mm diastolic, mitral regurgitation and stenosis and

severe angina pectoris decubitus. She had had her initial attack of rheumatic fever at the age of twenty-eight years and rheumatic heart disease was noted thereafter. Frequent respiratory infections in 1930 were followed by a recrudescence of rheumatic fever and she was confined to her bed for six months. During this time there was considerable aching precordial pain which she thought was pleurisy. Toward the end of this illness she began to have angina pectoris. The pain was severe paroxysmal in nature and although precipitated promptly by exertion or excitement it occurred most often without provocation and especially at night. It began substernally and in the precordium spread transversely and radiated through to the back to the neck and down both arms. It usually subsided in five to ten minutes but at times lasted as long as an hour. Nitroglycerin and amyl nitrite gave relief of the pain, but not of the associated discomfort of palpitation, respiratory distress and profuse sweating. The recumbent position appeared to be a predisposing factor and she found that by sleeping three pillows the episodes of pain and dyspnea were less frequent.

She entered the hospital in January 1935 and alcohol was injected about the first four thoracic sympathetic rami on the left side. A well-defined Horner's syndrome and the peripheral signs of sympathetic nerve block followed. A slight left-sided pleurisy subsided in a few days and no intercostal neuralgia appeared subsequently. The angina pectoris was completely and permanently relieved over the left side of the chest, but slight pain persisted in the vicinity of the left elbow and has since involved a somewhat greater extent of the arm. Here as in case 1 lipiodol injected through the highest needles showed a poor infiltration of the tissue around the first thoracic ganglion. She continued to have frequent attacks of severe right-sided angina pectoris with minimal pain near the left elbow. An injection of the first four rami on the right side as well as further injection of the first rami on the left (for the arm discomfort) was considered but with subsequent improvement in her general condition and subsidence of active rheumatic disease during the next three months her attacks of right-sided pain became much less frequent. They are now directly dependent upon unusual exertion or excitement and nitroglycerin gives prompt relief. She leads a quiet life comfortably and was last seen in June 1935. The excitement of a clinic visit precipitated a moderately severe attack of right-sided angina pectoris while being examined. Nitroglycerin relieved her promptly. The heart rate increased during this episode from a resting level of 80 per minute to 120 during the height of the pain and returned slowly in the course of ten minutes to a rate of 85. Further injection has been postponed for the present. We believe however that interruption of the sympathetic pathways on the right side may be necessary later if she has a recrudescence of active rheumatic disease.

CASE 4 (B M No 20842) H C., a man thirty-five years of age was seen by us for the first time in November 1935. He had extensive rheumatic heart disease with marked enlargement, free aortic regurgitation with a blood pressure of 170 mm of mercury systolic and 60 mm diastolic and apical systolic and diastolic murmurs suggesting mitral valve involvement. At postmortem examination later the mitral cusps were found to be normal. Frequent physical examinations had revealed no evidence of heart disease prior to the onset of rheumatic fever at the age of thirty-one years in 1931. Heart disease was found shortly thereafter.

The subsequent course indicates that rheumatic infection probably persisted for the remaining four years of his life manifested clinically by poor health, progressive weight loss, low grade joint pains (at times more pronounced), and progressively increasing cardiac symptoms of palpitation and breathlessness. In 1932 and one year after the onset of rheumatic fever he began to have clear-cut attacks of angina pectoris both on exertion and at rest. The majority occurred at night. The attacks increased in frequency and severity and during the year prior to hospital entry he had been compelled to lead a bed and chair existence. Often there were as many as twenty to thirty anginal attacks during the course of twenty-four hours. They were characterized by intense precordial and substernal pain chiefly on the left side spreading up the neck as far as the jaw and down the left arm to the wrist. Rarely he had felt slight pain in the right arm with unusually severe attacks. Here again there were accompanying circulatory phenomena of tachycardia, palpitation, respiratory discomfort, generalized flushing of the skin and profuse sweating. Nitroglycerin under the tongue relieved the pain and he often used as many as fifty pills in twenty-four hours. Crumbling joint pains, pallor and obvious weight loss as well as a leukocytosis and an elevated (corrected) sedimentation index indicated a persistently active rheumatic infection when he entered the hospital. This was further supported by the finding of a P-R interval of 20 to 21 seconds by electrocardiogram. Left bundle branch block was also present.

Alcohol injection of the first four thoracic sympathetic rami on the left side resulted in the usual peripheral signs of sympathetic nerve block and complete relief of the painful component of his attacks. Their occurrence however continued with undiminished frequency as indicated by a sense of tightening in the throat and the uncomfortable circulatory phenomena. A left-sided pleurisy due to irritation of the adjacent pleura lasted several days but caused no great difficulty. The patient died unexpectedly in bed while talking to a nurse ten days after the injection. The heart at postmortem examination weighed 800 grams. There was slight scarring and moderate insufficiency of the aortic valve cusps. The mitral leaflets appeared to be normal. At the base of the aorta there was an active endarteritis which on gross examination suggested a luetic process but histologically the type of reaction more closely resembled that occasionally observed in the aorta with severe rheumatic infection. This interpretation was further supported by a negative serology (Hinton reaction) and the absence of clinical evidence of lues. The mouth of the right coronary artery was slightly narrowed but beyond their mouths both main coronaries and all their major branches were entirely normal.\* No adequate cause for the sudden exitus was found. There had been a striking and complete relief of the severe anginal pain in this patient following left-sided sympathetic nerve block. The discomfort dependent upon the associated circulatory disturbances remained unaltered.

#### DISCUSSION

Paravertebral alcohol injection of the thoracic sympathetic rami communicantes has been followed by unusually satisfactory results in this small group of four young patients with severe

\* A further clinical and pathological discussion of this unusual case may be found in the Case Records of the Massachusetts General Hospital, Case 22141. New Eng J Med 214:466 (April 2) 1935.

rheumatic heart disease and disabling angina pectoris. The pain was successfully relieved in the area supplied by the peripheral distribution of the injected nerves. In Case 1 the persistence of modified pain in the left side of the neck indicated incomplete destruction of the first thoracic ramus, and in Case 3 minimal pain in the region of the left elbow likewise pointed to a partially inadequate injection of the first ramus. Subsequent improvement in these patients, however, made further injection unnecessary. Furthermore, postoperative neuralgia which at times is a troublesome complication in the older patients has been entirely absent. The exact explanation of this favorable feature is not clear. Further experience may show that it was merely a fortunate coincidence, but certainly the slender physique and the thin chest wall in these young patients favor a more accurate injection than is possible in the older group where a barrel-shaped chest and obesity frequently render the procedure technically difficult.

Certain clinical features have been characteristic of the atypical anginal syndrome in this special group of young people. Free aortic regurgitation and a low diastolic pressure were present in each instance. In the two fatal cases the coronary arteries were widely patent throughout, although in one instance the right coronary artery was partially encroached upon by an active endarteritis at the base of the aorta. In each of our patients the pain has been intense, paroxysmal in nature, and has had the same distribution as angina pectoris associated with coronary heart disease. A characteristic feature has been the frequency of attacks without provocation. The most severe have occurred at night and the recumbent position appears to be a predisposing factor. The associated circulatory phenomena of tachycardia, palpitation, generalized flushing of the skin, profuse sweating, and difficult respiration are essential features of the attack. They usually precede the appearance of pain and occasionally in the milder episodes occur without the painful component. The pain, on the other hand, has not been observed in the absence of the circulatory disturbances. In Case 1 the associated respiratory discomfort was intense and at times pulmonary edema ensued. It is evident that the subjective and objective features of the attacks constitute a remarkably consistent clinical picture. Lewis studied episodes in a comparable group of four patients and pointed out an interesting relationship between the elevated systolic level of blood pressure preceding the onset of pain in his patients and the favorable influence of amyl nitrite on the pain before the blood pressure had been significantly altered. So constant were the clinical features in his

patients that Lewis believed them to represent a special type of angina pectoris. With this view we are in agreement. There remains, however, an important factor not previously commented upon which may be in part responsible for the atypical features of the syndrome. At least in our group the presence of clinically active rheumatic infection has not only clearly initiated the appearance of the anginal syndrome but also has increased the frequency and severity of the attacks. Furthermore, with subsequent quiescence of the rheumatic disease the attacks of pain have reverted to a more typical form of angina pectoris in their direct dependence upon unusual exertion or excitement as precipitating factors. In further support of the probable important rôle that active disease plays is a second well-recognized group with so-called atypical angina pectoris in patients with cardiovascular lesions and free aortic regurgitation (Case 1 of Lewis's series). In these patients nocturnal episodes of angina pectoris without provocation and frequently associated with cardiac asthma often respond promptly to specific antiluetic therapy.

It is evident then that there does exist in the presence of free aortic regurgitation and occasionally in relatively young people a characteristic but atypical syndrome of angina pectoris accompanied by important circulatory disturbances. It is probable that coronary insufficiency of an order to produce pain in these patients is dependent upon a combination of factors. White and Mudd<sup>6</sup> have emphasized the uniform finding of free aortic regurgitation in this younger group. There are, however, a few authentic cases of angina pectoris in young rheumatic patients with mitral valve disease without aortic regurgitation. Lewis<sup>1</sup> has suggested coronary spasm associated with an unusual and temporary elevation of blood pressure as a possible factor in the production of pain in the patients he studied. A further interesting feature has been the associated tachycardia preceding the appearance of pain. That this may be an additional factor contributing to an insufficient coronary blood supply is suggested by the observations of White and Campbell<sup>6</sup> on the status anginosus induced by paroxysmal auricular fibrillation and paroxysmal tachycardia in older patients with coronary heart disease. Finally, the clinical course of our patients emphasizes the importance of active cardiovascular disease, either of rheumatic or luetic nature as an additional and probably essential feature of the syndrome.

#### SUMMARY

1. Relatively young people with severe angina pectoris complicating rheumatic heart disease appear to be an unusually suitable group for

the relief of pain by paravertebral alcohol injection of the thoracic sympathetic rami communicantes

2 Postoperative neuralgia has not occurred in our series of four cases

3 Attention is called to the probable importance of active cardiovascular disease either luetic or rheumatic, as an essential feature of atypical angina pectoris in young people with free aortic regurgitation

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## SILICOSIS

BY JOHN B. HAWES, 2ND, M.D.\*

VERY few physicians are aware of the extent to which claims for alleged injury and disease due to dust are being brought before courts and industrial accident boards in this country. The situation in this regard amounts to a "rack et" compared with which others, notorious in New York, Chicago and elsewhere fade into insignificance. Unscrupulous lawyers have then "runners" on the lookout for any employee who is exposed to dust in the course of his work no matter what the nature of the dust nor however harmless it may be who happens to come down with a cough or a cold or indeed with almost any other illness and then and there try to persuade him to bring suit. Unfortunately in too many instances, physicians partly through ignorance and partly through an honest desire to help their patients and perhaps on the general theory of "soaking the insurance company" are willing to testify that the dust to which this individual had been exposed was entirely responsible for his condition. In nearly 100 per cent of such cases the doctor takes at its face value the word of the worker and his friends as to the dust hazard without any real knowledge of the situation obtained from a personal inspection of the plant or at least by interviewing those in a position to know.

Within the past year for instance, an extremely high grade general practitioner in this state testified under oath that the tuberculosis from which a certain man suffered was associated with and due to a pneumoconiosis contracted from his exposure to dust in a certain woolen mill. Aside from the fact that the organic dusts do not cause pneumoconiosis and are quite harmless I had previously inspected this particular mill and seen the exact work this man was doing and had first-hand information as to the extremely high-grade working conditions in this particular plant. Recently I was requested to examine a certain young man of twenty-one who was a patient at a sanatorium in Massachusetts. He had been a cloth cutter

for some years. He had a moderate amount of tuberculosis which was doing very well indeed but he put in a claim before the Industrial Accident Board of this state on the grounds that it was the dust involved in cutting cotton cloth with scissors and a machine which had led to the reactivation of his disease. He was encouraged in this belief by his own physician who had given his opinion definitely in writing to this effect. I examined the premises where he had worked which I found to be ideal in every possible way being as a matter of fact one of the activities of a prominent and highly respected Boston charity for the handicapped. Not only is cotton dust perfectly innocuous so far as the lungs and tuberculosis are concerned, but also the conditions under which this man worked were so extraordinarily good that any possible injury to the patient from this source was out of the question.

Perhaps one of the most striking examples of this is now being argued in one of the very large industries of this country the plants of which in Massachusetts I have personally inspected. Here certain workers are exposed to

1. Minute quantities of iron or steel rust which is harmless,
2. Equally microscopic amounts of lime equally innocuous,
3. An almost infinitesimal amount of a silicate, less than 1 per cent found as an impurity of the lime, and
4. Small amounts of powdered soap used as a lubricant.

Each and every one of these ingredients is absolutely harmless in the minimum amounts to which the workman was exposed. As I mentioned above, I have gone through several of the plants where this work was being done and have stood by the workers and seen each and every operation. And yet, allegedly reputable physicians have testified in the cases that have so far come to trial that this dust as described above had caused pneumoconiosis to develop and was responsible for the workman's tuberculosis,

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bronchiectasis, heart failure or whatever the plaintiff happened to claim in spite of autopsy findings ruling out any dust disease! Truly a deplorable and almost shocking state of affairs!

I feel very strongly, therefore, that general practitioners and particularly those specializing in diseases of the lungs and tuberculosis might well familiarize themselves with this general subject of silicosis and acquire accurate knowledge concerning those dusts that are harmful and those that are not. Hence this article.

The dangerous dusts are those that contain silicon in some form. All organic dusts—flour, tobacco, cotton, wool, wood, etc.—and all non-silicon-containing dusts such as carbon, coal, iron, lime, marble, etc., are considered to be and are harmless. This statement needs little or no qualification. Workers in coal mines get anthracosis, it is true, but it does them no harm and does not render them susceptible to tuberculosis. If they contract silicosis it is because of the granite or some other silicon-bearing rock in which the coal is imbedded. I remember a man who fell down a chute in a lumber mill and was buried for an hour or so in a pile of sawdust from which he was taken out unconscious. He developed bronchiectasis but this does not prove that the ordinary wood dust to which a man using a turning lathe is exposed is in any way harmful. One of the most extreme cases of silicosis I ever saw was in a man working in a chocolate factory! Upon investigation I found that his job for years had been to "re surface" the granite millstones used to grind the cocoa bean. Hence his silicosis. Another man with definite and marked silicosis worked in a carpet factory. I was greatly puzzled as to how he acquired his undoubted silicotic disease until I inspected the plant. Here in a very large room were many bales of wool coming from Egypt or some other foreign source. This man's job was to open these bales, sort and spread out the wool and put it in big armfuls down a chute for the next process. It was evident that he came into close and intimate contact with the raw material. On the floor of this room there was one-eighth to one-quarter inch of dry brownish sand. Hence this man's silicosis.

Again Dr. M. J. Stone and I recently came across two men with undoubted silicosis each a worker in the garment trade, surely a harmless enough occupation as far as silicosis is concerned. On careful inquiry I found that each of these men had worked in a porcelain factory in Russia fifteen and eighteen years ago respectively which of course explained the silicosis.

Granted then that the dangerous dusts are only those which contain silicon in some form, in what form does this danger consist? It may be stated as follows:

(1) The form of silicon which is present. Silicon dioxide in crystalline form as found in quartz, granite, sand and in certain other minerals, is considered to be the chief and primary factor in causing damage to the lungs in the way of silicosis. The silicates as a whole are considered comparatively harmless. The majority of authorities in this country are firmly of this belief. To this there is one exception, namely, asbestos, which is an aluminum and magnesium silicate, the exact ingredients depending upon where the asbestos is mined. This for some reason not as yet known but probably at least partly due to its fibrous nature is one of the most dangerous of all dusts. The other silicates such as those found in talc, cement and certain minerals are comparatively harmless unless the concentration is very high indeed and the exposure an extremely long one.

(2) Length of exposure. Ten to twelve years is the average minimal time in which a normal granite cutter will contract definite, diagnosable and disabling silicosis.

(3) Intensity of exposure. A man working in dust which contains only 5 per cent to 10 per cent of free silica will take a much longer time to develop clinical disease than if the concentration were higher.

(4) The size of the dust particles. Particles of dust, ten microns or over, do not enter the finer parts of the lung and are taken care of by the normal dust-removing apparatus. The dangerous particles are those, five microns or less in size, the danger increasing inversely with the size.

(5) The fifth factor consists of that unknown equation, the resistance of the individual. Just as certain individuals have no resistance to tuberculosis and others have it to an enormous degree, so undoubtedly there are men and women who can stand large amounts of harmful dusts for many years and others who will break down in a comparatively short while.

(6) Pre-existing disease. The final factor which must always be given serious consideration is whether there is any handicap already existing in the way of disease of the heart and particularly of the lungs such as tuberculosis. It is well to remember that 75 per cent of all granite workers, for instance die of tuberculosis and that 89 per cent of the workers in the mines of South Africa die of this disease.

The diagnosis of silicosis at the present time is far too often left to the roentgenologists who are too prone to make definite statements as to the presence or absence of silicosis from the appearance of the x-ray plate alone. In this condition the diagnosis depends upon the following:

(1) *History*. Has the patient been exposed



to dust of any kind and is this dust one of the dangerous variety? Here I would urge again that physicians examining such cases in which they may be called upon to testify in court or before the Industrial Accident Board do not take the patient's word altogether but confirm his statements, if possible, by seeing the working conditions for themselves or at least by talking with someone who can speak with authority on this subject

(2) *The patient's symptoms* In early cases, just as in tuberculosis, symptoms may be conspicuous by their absence. In well-marked cases of silicosis, however, shortness of breath on the slightest exertion is by all means the most striking symptom. Loss of weight and strength are not by any means common. There may be and often is a dry, harassing cough but this, too, is often absent. Fever, pain, night sweats, raising of sputum and blood spitting are rare, and if present, are generally due to an associated tuberculosis.

(3) *Physical examination* This may reveal very little. Markedly limited chest expansion is striking and of great importance. A general appearance of robust health with good color is the rule rather than the reverse but if the individual is put through any sort of a test such as walking rapidly or deep breathing manifest dyspnea will be evident.

(4) *X-ray* The x-ray in advanced cases is of the greatest importance and in itself may be diagnostic. The x-ray in the early stages may show very little. In a marked case of silicosis diffuse granular mottling beginning around the root of the lung and the middle one third, extending then to the bases and last to the apices gives a striking picture. Differential diagnosis must be made between a miliary tuberculosis which is usually not difficult except in chronic cases, miliary carcinomatosis, which is rare and finally, one of the various yeast infections which are not so uncommon as we have been accustomed to believe. Such conditions may be extremely difficult to differentiate from silicosis by the x-ray alone.

Treatment of this condition is of little or no avail. The individual of course should be removed from his dusty occupation and should live within his limitations. The disease is a progressive one although symptoms may lie in abeyance for years and then suddenly crop out sometimes following an acute respiratory tract infection such as pneumonia, influenza or an acute bronchitis. As stated before, silicosis reduces the resistance to tuberculosis to a tremendous extent and likewise to other respiratory diseases particularly pneumonia. If the pa-

tient does not die of tuberculosis or pneumonia his heart and circulatory apparatus will eventually give way owing to the increasing burden put upon them through the formation of fibrous tissue.

Twenty or twenty-five years ago "granite cutters' disease" and similar conditions were supposed to be a form of tuberculosis. Even at the present time certain prominent French observers refuse to admit that silicosis exists as a clinical entity but maintain stoutly that it is a form of tuberculosis which theory is of course no longer accepted in this country. As recently as the past decade, however, most of us were of the opinion that the damage done by the particles of granite, for instance, was due to a mechanical process, we felt that each particle of dust, then thought to be insoluble, acted as a foreign body in the lungs and eventually became surrounded by a mass of scar tissue which tended slowly to increase with the natural consequences. Now, however, thanks to the work of Gardner and Cummings at Saranac, Lanza in New York and those connected with the U. S. Public Health Service and others, we know that silicon acts as a slow tissue poison and is slowly dissolved by the body fluids and excreted through the kidneys and in other ways and that it is the reaction to this poison that results in the formation of fibrous tissue.

It is well to bear in mind in this discussion that silicon is found normally in the human body and that it is present in practically all of the dust which we breathe but it is only when it exists in excessive amounts and in the form of crystalline silicon oxide that it becomes dangerous to health. Exposure to small amounts of silicon in the form of talc, for instance, which is the chief ingredient of dusting powders, etc., is perfectly harmless while minute quantities of silicon found as an impurity in other substances are equally innocuous.

The treatment of this disease is of course in prevention. This means

- (1) Examination with an x-ray of all employees prior to entering a dusty trade,
- (2) Periodic examinations of employees so exposed,
- (3) Rotation in services as for instance, changing the sandblaster every few months to another occupation,
- (4) Efficient dust-removal apparatus and really efficient respirators in the extremely dusty occupations such as sandblasting.

If such measures as these were efficiently carried out, the tremendous death toll due to silicosis would become a thing of the past.



## PSYCHOBIOLOGY IN GENERAL MEDICINE\*

BY KENNETH J. TILLOTSON, M.D.†

**M**ODERN psychiatry has become an important and integral part of general medical thought and practice. In this new relationship, that is, the collaboration between psychiatrists and all other departments of medicine, psychiatry has gained much and at the same time has contributed a great deal to the study and consideration of patients from the standpoint of the patient-as-a-whole, or as a psychobiological unit.

Since all medicine today is in part an applied science and since the principles of psychobiology are essentially scientific, the particular psychiatric approach that embraces these concepts of psychobiology goes farther than previous theories in psychiatry both in scope and from a scientific standpoint. Psychiatry has been considered a specialty and no doubt it has been regarded in the past by most physicians as an isolated one. It has also been criticized as unscientific or weak in its scientific formulations. It has been regarded as difficult to understand by a large group of practicing physicians. It is the opinion of the writer that much of the static psychiatry of Kraepelin like many of the academic psychologies, fulfills a useful purpose and is still important to the psychiatrist, but falls far short of offering to the clinician a point of view and a method of dealing with his daily problems, in a practical, helpful, or commonsense manner. The interpretive and mechanistic theories of Bleuler, together with the contributions of Jung, and Freud, dealing as they do with the unconscious motivations or with the rôle of the unconscious mental mechanisms in producing symptoms, have added much to our knowledge as psychiatrists and to the knowledge of the average physician. The psychobiological concepts and theories of Meyer, have however, utilized and crystallized the foregoing ideas in a workable manner so that the "workings" (ergasias) of the individual patient may be more intelligently approached and understood not only by the psychiatrist but by every physician who is called upon to treat a patient. While psychiatry is regarded as a specialty in medicine it can no longer be considered as either a narrow or an isolated subject. A little reflection and consideration cannot but convince anyone of its broad scope and far reaching importance. So many illnesses beginning as diseases or

strictly problems of internal medicine or surgery, pediatrics or obstetrics, and so forth soon overflow into the field of psychiatry and vice versa. One need but mention the delirium of typhoid fever and pneumonia and many other infectious diseases as well as the mental states associated with lead and other industrial toxins, the various mental symptoms accompanying alcoholism, tertiary syphilis, encephalitis multiplex, sclerosis, the anemias, diabetes, arteriosclerosis, senility and the effects of all endocrine disorders on the functions of the mind or mentation, but even all this is but a small part of the many reasons why every physician should cultivate that attitude which comes from a better knowledge of psychiatry or what might be termed the psychobiological viewpoint which is by no means a narrow or a one-sided viewpoint.

Psychobiology is in reality a study of the patient as a whole. It utilizes all of our contemporary psychiatric knowledge as well as our general medical knowledge. It by no means ignores the constitutional background and personality characterizations of the patient and even includes the genetic factors and the sociological factors. It gives to every physician methods of treating not only the physical symptoms of the patient but the patient's complaints. The complaint problem of the patient is the basis of approach in any medical work. This is particularly true in the psychobiological approach to the patient. To be sure, the patient's whims or peculiarities and eccentricities, his particular personality characterizations are reflected in the complaint problem and are therefore taken into account in this psychobiological study and investigation which leads us to an evaluation in every clinical picture of the influence of all factors in the function of the patient as a whole. The patient is thought of therefore, as a psychobiological unit and the study is a psychosomatic one. The mind and disturbances of mind function or mentation are not detached from the usual clinical symptoms elicited in the general medical patients. The usual causal studies and diagnostic procedures and their results are supplemented by a personality study and a review of a biographic type which reveals the patient's personality development and characterizations, the important social problems and the emotional problems and their relationship to physical symptoms or to the complaint problems as formulated by our patient. Mental symptoms and reactions are not separate in their genesis and development from physical symptoms and vice versa. Every patient is an "experiment in nature" and psy-

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chiatry simply carries this theorem into practice and a patient in the general hospital or in the psychiatric clinic and hospital or in the gastrointestinal clinic is in every case a psychosomatic study.

This leads to the treatment of all patients with a broader and most inclusive point of view on an entirely nonprejudicial basis. Mental reactions, emotional symptoms and physical symptoms are so closely integrated in any concept that leads to a consideration of the patient as a whole that no treatment is complete or successful that is not based on such a psychobiological approach and study.

It is with the foregoing in mind that the writer has approached the clinical work and practice of psychiatry in the different departments of the Massachusetts General Hospital during the past five years. The scientific value as well as the clinical assistance rendered in such collaboration to both internists and surgeons and psychiatrists is dependent upon a mutual understanding of the total clinical picture and of all of the factors involved. Psychobiology formulates these factors in a more understandable manner for the clinician.

During the past year the writer has been working in the gastrointestinal outpatient department clinic of the Massachusetts General Hospital in addition to the routine consultation and psychiatric teaching work that he has made in the psychiatric study of medical and surgical patients. This particular investigation of a very interesting group of patients with known organic disease and pathology in the gastrointestinal tract, that is, with known gastric ulcer, duodenal ulcer, hypertrophic gastritis and colitis and so forth is being made in collaboration with the internists and surgeons in order to give the emotional factors proper evaluation. This investigation of any underlying or accompanying emotional factors to be considered in the medical and surgical treatment of the foregoing group in order properly to evaluate physical and organic symptoms as well as the personality factors and the emotional components must be considered in the successful study and treatment of the patient. This constitutes actually a psychobiological approach into the total functions or workings of the individual as a whole. This leads to a better formulation of the factors involved and to the selection of the proper type of psychotherapy to be utilized in the treatment of the same.

Psychotherapy, generally speaking has been found helpful in the majority of these patients who have been worked with in the gastrointestinal clinic even in the presence of organic disease as above specified and often in spite of surgical repair that has in some cases taken place.

Another question of outstanding importance is that of the relation at the psychological level

of the physician to his patient with the understanding and the acknowledgment of the fact which rarely seems to be mentioned that the experimenter or the physician in every such position is part and parcel of the problem which he is undertaking to solve. This has properly been given a scientific sociological evaluation by Henderson in his article "Physician and Patient as a Social System." What has just been said concerning psychotherapy is only a special case of the broad principle that in all of man's efforts to explain and understand himself he cannot objectify his problems in accordance with the demands of the physical sciences. He is a part of what he is trying to explain, a fact that those same physical sciences are taking more serious thought of at the present time and this must be continued in the future. This fact makes all contributions in the field of psychotherapy peculiarly subject to artefacts and peculiarly difficult. This emphasizes, however the importance of a psychiatric viewpoint in general medical practice.

In many instances the emotional factors seem to be developed as an accompaniment or following the organic symptoms such for instance as hemorrhage or operation or pain with definite pathology. In other instances the emotional factors, the difficulties in adjustment, the inability to resolve the task of life, the personality characterizations were well marked for such a long time before the gastrointestinal disease manifested itself that the relationship between the emotional factors and the subsequent development of organic pathology is most striking. Psychotherapy is used of course by all physicians in various forms and in varying degrees. Its value and application no doubt have been emphasized and developed by the psychiatrist. There has been the practical problem of how general hospital patients should receive such psychotherapy of a more special type in case it was advised. This problem is very much aided by having psychiatrists in the general hospital giving regular amounts of time to consultation work and to special clinics. The problem of psychosomatic interrelations is continually a stumbling block to the specialist in many phases of scientific research or personality study. One of the important ways of overcoming these difficulties seems to be at the bedside of the patient or in a collaborative study of patients in the outpatient clinic or in the various departments of the general hospital. We have reached a point where progress in the specialties themselves has been blocked by a lack of understanding of the relationships between them. Scientists commenting on the tremendous gain which has accrued to us during the last decades of specialization are calling attention to the fact that many of the most vital of our problems lie between the sciences and cannot be

even preserved without going beyond the confines of a specialty. Recently Dr. H. Flanders Dunbar has emphasized the interrelations of emotional and physical reactions or symptoms. From the chapter dealing with gastrointestinal system in her book entitled, "Emotions and Bodily Changes" she writes as follows: "The folk mind, through language itself called attention to the psychological significance of the gastrointestinal tract. As a matter of fact this tract is one of the first organ systems in relation to which the significance of psychic factors in illness was brought home to physicians."

R. Schindler in 1928 writes, "Psychoneurosis of the gastrointestinal tract is caused by disturbances of its organ function as a result of participation of psychic factors with the absence of anatomical changes. How do they develop?" The significance of the conditioned reflex (Pavlov and Von Bergmann) is well known. A psychic experience happened coincidentally with a somatic symptom as for example, the sound of a trumpet with gastric secretion stimulated by a meal. Later, the same somatic symptom may occur without somatic cause merely in response to the same somatic experiences, in this case the sounding of the trumpet without the meal. Then suppose a lady suffers from an infectious enteritis. In this condition she has an unfortunate sex experience. From that time on she suffers from constant compulsive diarrheas which stand in readily discernible relationship to her sexual life.

Even without a conditioned reflex the site of some previous somatic disease becomes readily the site of an organ neurosis. An hysterical individual, for example, develops psychopathic swelling of joints having previously suffered from a rheumatic arthritis. The body has learned, as it were, the symptom. Furthermore, the sense of well-being remains decreased in a bodily part that has once been ill. This is the basis for the phenomenon of *Hängenbleiben* described by Heyer. The pain caused by somatic disease long outlasts the duration of actual organic disease.

A symptom having its origin in organ symbolism may nevertheless become a conditioned reflex in its own right and then become activated through bodily processes without further psychic causation. Cardiospasm may develop as a psychogenic organ symbol, then the psychic cause drops out and the symptom remains as a response to the act of swallowing.

The following cases studied in the Massachusetts General Hospital in collaboration with the gastroenterologist, Dr. Chester M. Jones, illustrate the type of material and the application of the foregoing psychobiological theories.

CASE 1 (P. F.) An American housewife aged thirty-nine, has been seen in the medical clinic of

the outpatient department since 1931. Her chief complaint is pain in the epigastrium, regurgitation of food and malnutrition. In 1932 it was demonstrated that she had constriction in her esophagus. This was relieved by surgical interference. Subsequently, however, her symptoms recurred and her cardiospasm has been relieved by the use of nitroglycerin. She now feels quite dependent on nitroglycerin which relieves the dysphagia and the cardiospasm and vomiting. At times, however, she is able to go several days without the symptoms of cardiospasm. Her social history reveals that she is the mother of two sons, the older son seventeen, is an epileptic having frequent convulsive seizures. Her younger son of thirteen is mentally retarded. Her husband is an electrician and earns a small salary. She is a woman of considerable intelligence and cultural background with a love for the "better things in life." She says that she is making the best of life. She has only part of the necessities and none of the luxuries. She has been interested in reading and in writing, has written poems and sonnets that have been published in magazines and papers. The husband is a kindly, gentle unromantic person.

**Personality Characterizations.** The patient is imaginative, romantic and obviously forced to live in a social atmosphere and at an economic level far below that which she desires. She has extreme apprehension and fear regarding the situation of her older son. She is somewhat concerned about the younger boy. Her sexual life is only fairly well adjusted and the other factors surrounding her environment enter into her emotional manifestations. She is tense, apprehensive, has fantastic dreams, usually wish fulfillments. Her cardiospasm and physical symptoms are always intensified by periods of worry as for instance following an epileptic seizure in the case of her older boy or following a period of depression over her social and economic dissatisfaction. A positive transference to different physicians in the clinic has been quite obvious. It is felt that she could probably get along without nitroglycerin only she feels that that might necessitate the termination of her visits to the clinic. The psychosexual mechanism here is likewise important. It is felt that this patient has been helped by psychotherapy inasmuch as her symptoms are less marked. Her cardiospasm may be cured by a longer period of intensive psychotherapy which in this case would necessitate a complete control of the patient with careful medical and x-ray studies that could only be obtained through hospitalization.

CASE 2 (E. M.) A thirty-five year old English born married hutler has suffered from duodenal ulcer with bleeding also from hemorrhoids. This patient has been followed in the gastrointestinal clinic by the internist with surgical consultation. Inasmuch as he seemed to be somewhat depressed and under emotional tension he is now being followed in addition by the psychiatrist. The following social and psychological factors were revealed: increased worry and extreme emotional tension occasioned first because the wife of his employer became psychotic. This entailed a very exacting and trying period in his occupational duties in the home. Following this his brother became involved in financial difficulties which necessitated his lending his brother the greater part of his life savings. These savings he had planned on using for the education of his children but he was now compelled to give them to his brother to save him from disgrace and possible legal prosecution. This involved the patient in a domestic altercation with his wife who objected to the foregoing act. A period of loss of sleep with severe epigastric pain and recurrence of

bleeding from his ulcer together with loss of blood from his hemorrhoids brought him to the clinic in a condition of depression with a good deal of emotional tension. A repair of the hemorrhoids, a modification of his diet and a medical régime plus psychotherapy have relieved the symptoms and the patient is practically recovered although he is still being followed up in the clinic.

**CASE 3 (O E)** Aged twenty-six was suffering from a severe ulcerative colitis. Examination of the psychobiologic factors brought out that this patient has suffered from ulcerative colitis for the past three years. The patient's older brother had distinguished himself as an explorer and writer as well as by making satisfactory progress in the university. The patient has done poor work scholastically, and in three years in the university has accomplished one year's credits. He is a special student. Three years ago his mother died and at about that time the patient fell violently in love with a young college girl. This affair became very soon an engagement. The patient lived in very close relationships with this young woman and finally after a year and a half the affair was terminated the girl returning to her home in the Middle West. Last November the patient's colitis became worse necessitating hospitalization. The patient revealed a strong mother attachment and he had always had more or less unconscious hatred of his father. He was practically forced to give up his fiancée because of her father. There had been conflict in his mind with feelings of guilt over the intimate sexual relations that he had carried on with her.

While he had made an excellent record in his preparatory school work and had been a fairly good athlete his accomplishments in college work have been almost nothing and his efforts seemed diffuse and his marks low with frequent failures. Attacks of colitis following emotional upsets and with emotional tension, depression, discouragement, feelings of guilt characterized the picture. Following fairly intensive psychotherapy the patient's colitis improved. He seems to have a good grasp on the underlying psychological factors and his emotional condition and his physical health are again for the first time satisfactory since his admission to the university three years ago.

**CASE 4 (D C)** The patient is a twenty-year-old male married American of New England ancestry who entered the hospital with a high fever. A diagnosis of infectious mononucleosis was made. A few days later he developed an infection of his ethmoid and following the drainage of the latter his temperature subsided only to rise again with definite localizing pains in the right hip joint. Following surgical consultation and treatment of the hip joint the patient became quite despondent and manifested depressive symptoms crying and exclaiming that he must die, that he could not get better.

The family history revealed that his mother is of a manic depressive type having suffered from more

than one psychotic attack. The father is somewhat moody with well marked periods of elation and depression. The father runs a country general store.

**Past History** The patient's birth and early development mental history were normal. His school progress was satisfactory and at the completion of his local high school course he entered college two years ago. During that time he has been in love with a girl whom he visited as frequently as possible at least once in two weeks. On the completion of his second year's college work last June he learned that this girl was pregnant. Reluctantly and after considerable hesitation he was forced by his father to marry the girl. In the autumn of 1935 about the time that his child was born he began to show some personality changes inasmuch as he seemed somewhat preoccupied and depressed. Because of his forced marriage to this young lady he was compelled to give up his college career and was employed in a small country store by his father. It was noticed that his work became very slow. He feared that he had made mistakes in making change and added up columns over and over in an obsessional manner. About this time while riding horse back he received abrasions on his ankles which became infected. This eventually led to the septic condition which necessitated his hospitalization. The patient when examined was mentally clear although obviously depressed and under great emotional tension. From his own discussion of his psychological problems and from the foregoing history it appears that the unexpected pregnancy leading him to marriage and the necessity for terminating his college course as well as his planned objective in life together with an abrupt transition from a student life with college fraternity and athletic activities and all the enjoyment that went with it to a position of working in his father's general store and the camaraderie of his village associates in a small town caused extreme emotional disturbances of resentment and disappointment with feelings of guilt. Depression developed plus manifestations of anxiety and discontent with compulsive phenomena. These emotional factors unquestionably lowered this patient's resistance to the series of infections that have followed so that the patient presents a medical and surgical picture of sepsis and infection with a characteristic reactive depression in which the genetic and dynamic factors are well marked. This latter case emphasizes the importance of psychosomatic factors in the formulation and treatment of this type of problem.

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## ROENTGEN THERAPY OF ACUTE POSTOPERATIVE PAROTITIS\*

BY J. MAURICE ROBINSON, M.D.,† AND JACK SPENCER, M.D.‡

**A**CUTE inflammation of the parotid gland may appear in the course of various debilitating diseases, usually as a terminal event. It also occurs as a not infrequent, highly fatal complication of major surgical procedures.

Statistics concerning its incidence after operative procedures of all kinds vary widely (Charlton,<sup>1</sup> 1 in 207 cases, Collins,<sup>2</sup> 1 in 762 cases, Beckman,<sup>1</sup> 1 in 2200 cases). Such figures depend almost entirely on the number of abdominal operations included in the group used as the basis of calculation, almost all of the postoperative cases reported in the literature have followed such surgery.<sup>1 3 4 5 7 12 14 16</sup>

This close association with abdominal surgery is best explained by the theory (experimentally<sup>2 6</sup> and clinically<sup>3 8 10 17</sup> substantiated) that acute parotitis, terminal or postoperative, is usually an ascending infection of the gland from the mouth, occurring as a rule in individuals whose resistance has been undermined by age, disease, intercurrent infection, or the effects of a severe operation, and that the most constant predisposing factors to it are dryness of the mouth and a diminution in the flow of saliva, such as follows dehydration from any cause, hyperpyrexia, the prohibition of fluids by mouth or the administration of opiates or atropin.

In the presence of these conditions, infection of the parotid can be produced in animals by injecting cultures of staphylococcus aureus into Stenson's duct or by smearing the organisms on the orifice of the duct (Claussé and Dupré,<sup>2</sup> Berndt, Buck and Buxton).<sup>2</sup>

The work of Rolleston and Oliver<sup>17</sup> further confirms this theory; they found that acute parotitis was a frequent complication (45 per cent) in a group of 470 cases of gastric ulcer treated medically in which food and fluid by mouth were interdicted (although antisepsis mouth washes were used), occurring ten times more often than in a similar group not so treated (04 per cent).

It is evident that serious abdominal operations more than any other kind are associated with the conditions most favorable for the development of this complication, principally because they are not uncommonly performed on very sick, dehydrated patients and because fluids by mouth are usually restricted postoperatively. Thus it is fairly common after any severely in-

fecting abdominal condition,<sup>3 5 7 15 16</sup> whether gastrointestinal, pelvic, or genitourinary, appearing with greatest frequency after surgery on the colon (Rankin and Palmer,<sup>16</sup> 1 in 139 cases).

The actual mortality depends upon many factors on the age and general condition of the patient, the type and extent of the operation, the virulence of the infecting organism, the extent of the parotitis and the method of treatment employed. As a whole, the death rate in those cases which suppurate is greater than in those that do not, and bilateral parotitis is considerably more fatal than unilateral.<sup>3 4 16</sup> But bilateral parotitis following a relatively simple abdominal operation is usually less of a catastrophe than, for example, unilateral parotitis after an abdominoperineal resection of the colon and rectum.<sup>4 17</sup>

In great part, however, the mortality will depend upon the type of treatment employed. The time-honored method consists of the application of hot or cold compresses to the swelling followed by incision if definite evidence of fluctuation is elicited, or, in the opinion of some surgeons,<sup>3 6</sup> early incision even if such evidence is lacking.

The prognosis following such treatment is not very good, almost one half of the patient die, according to the published reports (Rankin and Palmer 39 per cent,<sup>16</sup> Blair and Padgett 53 per cent,<sup>3</sup> combined American statistics of Green 58 per cent).<sup>12</sup> It is true that at least a third of these deaths can be ascribed to causes other than the parotitis.<sup>4</sup> In the remaining cases, however, the complication appears to be not merely a terminal event, but is apparently the immediate cause of death, usually representing the final blow to already weakened recuperative powers.

In 1930 Rankin and Palmer<sup>16</sup> reported the use of the radium pack in the treatment of postoperative parotitis. Their results left no doubt concerning its superiority over the compress and the knife. Of twenty cases treated by radium four died (20 per cent) although they ascribed only one of these deaths to parotitis. Of fifty-eight cases treated in the usual way, twenty-three died (39 per cent).

Bowling and Fricke<sup>4</sup> have recently reviewed 185 cases from the Mayo Clinic, including the twenty cases of Rankin and Palmer. Practically all of them followed major operations. They were treated by one to four eight-hour applications of a pack consisting of two, three or four fifty-millicurie blocks of radon (or a

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corresponding amount of radium) filtered through 2 mm lead, 1 mm brass and 15 mm silver, at a distance of 25 cm from the skin. Twenty-two and eight tenths per cent of the patients died, although parotitis, according to the authors, was the immediate cause of death in only six per cent, the remaining 17 per cent dying of some other complication, the original lesion, or the effects of the operation.

It seems fair to assume that this figure (17 per cent) represents about the percentage that would die for the same reasons in a similar group of untreated cases or cases treated by any method. If we exclude this 17 per cent from two such groups, one treated by the usual measures including incision, the other by radium pack it would appear that about 75 per cent of those who otherwise die from this complication alone can be saved by radiation (40 per cent less 17 per cent compared with 22.8 per cent less 17 per cent). Even if we consider all the deaths as failures of therapy the salvage is still 50 per cent (22.8 per cent compared with 40 per cent).

In view of these statistics one would expect that this method would be generally used in preference to other older forms of treatment. It is therefore surprising to hear surgeons occasionally express the opinion that these patients die or get better regardless of their parotitis. Such an opinion is certainly not based on any extensive study of the literature, nor can it be more than a mere impression derived from a few isolated instances in any one surgeon's practice. It is also surprising to find an article on this subject published as late as 1934<sup>18</sup> in which no mention is made of the use or value of radium treatment, emphasis being placed on prophylaxis and waiting for the infection to point before incision.

It is true that radium or radon is not more frequently used in the treatment of secondary parotitis because the amount required is not always available on short notice in most institutions. The value of radium in the treatment of this condition depends in great part on early application since it reduces the death rate principally by preventing the formation of a parotid abscess.<sup>1, 16</sup> Nor can the comparatively large amounts of radon or radium employed in the technique of Bowing and Fricke<sup>4</sup> be replaced by smaller amounts, if these are heavily filtered, the dose delivered from a one-inch distance is negligible. If applied without heavy filtration, close to the skin, a large perhaps dangerous dose may be delivered to the skin but very little will reach the lesion below it.

High voltage roentgen therapy, however, suffers from none of these disadvantages; it is generally available readily accessible, demands

no particular preparation, delivers a uniform, easily controlled dose throughout the swelling, and does so in a few minutes as compared with the several hours required if a radium pack is used. For these reasons Dr. George W. Holmes early suggested its use at the Massachusetts General Hospital instead of the radium pack in the treatment of this condition.

Roentgen irradiation has long been advocated in the treatment of the chronic form of parotitis and has successfully replaced radium in the therapy of various other inflammatory conditions.<sup>19</sup> Fried<sup>11</sup> was the first to use and recommend roentgen irradiation for all forms of parotitis, acute or chronic. It was employed by Oettingen<sup>14</sup> in a group of sixteen cases of acute parotitis following laparotomy but he found it of little value. He admitted that his failure was probably due to the small doses of radiation employed by him so that the amount delivered into the inflammatory mass was inadequate.

In 1935 Geiber mentioned its value in the acute postoperative form while discussing a paper of Dorrance's<sup>9</sup> on the treatment of chronic parotid inflammation. This is the only reference to its use that we have been able to find in the American literature, although it has been used, to our knowledge in several clinics.

During the past three years, twelve cases from the wards and private wings of the Massachusetts General Hospital have been treated. Although the series is small, the results obtained would indicate that roentgen irradiation is therapeutically as effective as radium, in some respects it seems to be superior to it. Filtered high voltage or "hard" irradiation is employed. It is therefore necessary to move the patient to the x-ray department, but this has not proved to be a serious objection. It would be possible, of course, to approximate the desired "hard" ray by properly filtering a suitable portable apparatus, but this step entails certain difficulties, and so far we have not found it necessary. Lightly filtered or unfiltered radiation has not been used because of the difficulty of delivering the necessary dose without injury to the skin, or of uniformly distributing it throughout the inflammatory mass. Three hundred roentgens (occasionally 200 or 400 roentgens) are directed to the involved side, or if bilateral, to each side at one sitting through a 10 centimeter cone. The factors used are 200 kilovolt peak, 50 to 60 centimeters focus skin distance, 5 millimeter copper and 1 millimeter aluminum as filter, effective wave length 16 Angstrom units. The dose is measured without back scattering.

This represents approximately one-half skin erythema dose and corresponds fairly well to the dose delivered to the skin by the radium pack of Bowing and Fricke<sup>4</sup>; the depth dose



however, as we have already pointed out, is greater and more evenly distributed

The essential data in these twelve cases are tabulated in chart 1. All of them followed laparotomy three, cholecystectomy, two, resection of the colon, two, appendectomy, two exploratory laparotomy, and one occurred after exploration for common duct stone.

There were three deaths (cases 5, 6 and 7), one of these patients was a woman of seventy-three years with general carcinomatosis and diabetes, another was a woman of eighty-three years with acute appendicitis and general peritonitis. In both, there was definite diminution of the swelling before exitus, obviously other factors than parotitis were the actual cause of death. The third patient, a man of fifty-nine years (case 7), with cirrhosis of the liver and common duct stone, died one week after complete disappearance of the parotid swelling.

Two cases suppurred and were incised, although both had shown some response to x-ray. In one of these patients, the condition when treatment was started may have been of longer duration than was stated in the patient's record, for there was perforation into the external auditory meatus within twelve hours of its presumable onset.

Bilateral involvement is generally considered to be definitely more serious than the unilateral form, with comparative mortalities of 56 per cent to 36 per cent when treated by the usual methods. Even after radium treatment many die. Although only thirty-two or 17 per cent of the patients in Bowing and Fricke's series developed bilateral swelling, the mortality was 40 per cent as compared with 19 per cent in the unilateral group. The value of roentgen therapy was therefore most conclusively shown in the four patients with bilateral parotitis representing one-third of our cases, these recovered completely (cases 1, 2, 3, and 4). One of them was practically moribund when treatment was started.

The usual history and course in our patients was as follows:

Two days to two weeks after operation there was a sharp rise in pulse and temperature. Soon after the patient complained of pain at the angle of the jaw and trismus. A swelling below and in front of the ear appeared, rapidly increasing in size. Cloudy or frankly purulent secretion could sometimes be expressed from the reddened papilla.

Generally within four to twenty-four hours after the swelling was noted, roentgen treatment was given. The infection then took one of three courses:

(1) Within twelve hours of the treatment, the swelling and pain had increased markedly. In the following twenty-four hours both began

to subside. At the end of three days to a week later, there was little or no residual evidence of inflammation.

(2) Within six to twelve hours, the pain had markedly decreased although the gland did not change in size. Twenty-four to forty-eight hours later, however, it was definitely smaller, and improvement continued as in the first group.

(3) There was no response to therapy for forty-eight hours, after which the fever, pain and swelling diminished very slowly.

The early disappearance of the pain and discomfort associated with the swelling was particularly striking in some of our cases. When the response was slow, the temptation to increase the mass was great. Delay was usually rewarded, the swelling eventually subsided without abscess formation or else became localized so that only a small incision was necessary.

Case 3 is of unusual interest because of involvement of both submaxillary glands twenty-five days postoperatively, eight days after the swelling of the parotid glands had completely subsided. Such a complication has rarely been noted, presumably because the mucin secreted by this gland possesses bactericidal properties.

In this patient the first evidence of infection appeared as a swelling of the right parotid twelve days postoperatively, followed within twelve hours by involvement of the left. Both sides were radiated the next day. Within twenty-four hours of the second treatment the pain and discomfort were much less, and the patient was able to open her mouth and take fluids. In six days all evidence of the infection had disappeared. Seven days later, twenty-four days postoperatively, the right, and a few hours later, the left submaxillary gland became swollen, forming a mass the size of a hen's egg extending into the mouth. Within five hours following radiation, the pain was much less marked. The patient was then transfused. Twenty-four hours later both glands had decreased in size, the pulse and temperature dropping to normal at the same time. Three days later there was no visible or palpable swelling. Some of the effect should no doubt be ascribed to the transfusion.

The action of radiation on the inflamed gland, whether radium or x-ray is used, is analogous to its action in other inflammatory conditions. If applied early it often aborts the process completely, or causes early localization, later it may cause similar localization or have no effect. The pointing which follows the localization of a carbuncle, for example, is as a rule replaced by drainage through the duct in the case of the parotid. The analgesic effect of radiation on inflammatory processes has often been noted.

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Comment

Recovered	Completely subsided in three days
Recovered	Treatment followed by purulent discharge from both ducts Swelling completely subsided in 4 days Recovery in spite of very poor general condition
Recovered	Pain diminished in both parotids in 24 hours One week later all swelling gone Developed swelling of both submaxillary glands 25 and 26 days postoperatively Dramatic response to radiation beginning 5 hours after treatment Swelling gone in 3 days
Recovered	Next day swelling double in size Third day began to subside purulent discharge from ducts One week later completely well
Died	Definite improvement noted in 12 hours Died third postoperative day
Died	Completely subsided in 3 days Died 2 days later
Died	Completely subsided 8 days after treatment Died one week later
Recovered	Completely subsided in 5 days
Recovered	Began to subside remained stationary for 3 days Gradual improvement the following week
Recovered	Perforated into external auditory meatus 12 hours after first treatment Subsided somewhat Treated again 5 days later Incised 2 and 6 days after this Recovery
Recovered	Began to subside 24 hours after radiation Six days later fluctuation Abscess incised Recovery
Recovered	Dose repeated in 24 hours from opposite side because not responding Completely subsided in 5 days

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Although the final result is practically the same, roentgen radiation seems to have a more immediate effect on the pain and swelling than

tional social and psychological deviations. Divorces in Massachusetts will thus tend to include individuals who are more of a risk in so far as the development of mental disease is concerned.

Those who enter marriage may be superior biologically in that they have less mental disease. That superiority, however, is of no avail unless the marriage is preserved. When the protection of the home and family is removed both the widowed and divorced show more mental disorder than those who have remained single.

#### SUMMARY

Analysis is made of the marital status of 61,222 first admissions to New York and Massa-

chusetts mental hospitals for the five-year period 1928 to 1932 inclusive. The marital status of first admissions is then compared with the marital status of the general population fifteen years and older of those States.

The admission rates for the married group are the lowest and those for the single group are next in order. The low rates for the married do not apply unless the marriage is preserved. If the marriage is dissolved through death or divorce the admission rates rise to much higher levels than for those who remain single.

Apparently marriage is a protective factor of considerable significance in the development of mental disorder.

## NEW HAMPSHIRE MEDICAL SOCIETY

### SCIENTIFIC SESSIONS

THE Opening Session of the One Hundred and Forty-Fifth Annual Meeting of the New Hampshire Medical Society convened in the Ball Room of the Hotel Carpenter, Manchester New Hampshire on Tuesday morning May 26 1936 at ten o'clock, with President Abbott presiding.

PRESIDENT ABBOTT The One Hundred and Forty-Fifth Annual Meeting of the New Hampshire Medical Society is now in session.

We shall open the meeting with a paper, "The Irritable Colon: Diagnosis and Treatment by the General Practitioner," by Dr. J. Dunbar Shields of Concord.

The following two papers were also read: "Artificial Pneumothorax in the Treatment of Tuberculosis," John D. Spring, Nashua. Discussion opened by Robert B. Kerr, Manchester, and Robert M. Deming, Glencliff.

"Diuretics and What They Do," Henry A. Christian, Boston, Hersey Professor of Theory and Practice of Physics, Harvard Medical School. Discussion opened by Bruce Snow, Manchester, and Walter F. Taylor, Keene.

#### TUESDAY AFTERNOON MAY 26 1936

PRESIDENT ABBOTT The meeting will please come to order.

Our first business this afternoon is the presentation of the Fifty-Year Membership Gold Medal to Dr. Ellen A. Wallace of Manchester.

Dr. Wallace it is my pleasure to present to you the New Hampshire Medical Society gold medal to commemorate fifty years' membership in this Society.

Thus also infers fifty years' medical service to your fellow men.

I believe that you are the second woman to be so honored by this Society. When you started in practice the woman physician was somewhat of an innovation. She was supposed to care principally for women and children. But today, thanks to the quality of the women that have entered practice, medicine knows no sex. The woman is measured only by the same standards of professional attainments as the man.

Some years ago, Sir William Osler on an occasion to honor Dr. Mary Putnam Jacobi, said, in effect, that he was looking for the really great woman physician, one who would rank with the Hunters, the Jenners, the Pasteurs and the Listers. But he said that he was not looking for her on the practical side of medicine; he wanted her on the scientific side.

If that was true then, why not today?

If I were to advise a young woman entering medicine as to what branch to follow, I would advise against general practice, surgery and gynecology, believing that there is a greater opportunity for advancement and a more congenial life in the sciences.

Taking into consideration woman's superior ability for fine technical details, I would suggest research in the pathological laboratory, x-ray or ophthalmology.

Dr. Wallace I congratulate you on living and practicing medicine for fifty wonderful years.

DR. ELLEN WALLACE *My President, Members of the New Hampshire Medical Society, and Friends*—I thank you most heartily for this gift of recognition of my fifty years of membership in the Society.

When I decided to settle in Manchester I came down from my home in Concord to make

is biologically superior to the unmarried, then this may be reflected in the low incidence of mental disease

The single show admission rates that are somewhat higher than those of the married, but the ratio of 1.4 is not extreme. The single lack the marital inter-relationships which or-

mental disorder, clinical psychiatrists tell us an even more interesting story in this connection. Many of the widowed who develop mental diseases have been rather odd individuals for many years and have been protected for long periods by the husband or wife. Once this protective factor is removed through death, the mental

TABLE 1

MARITAL STATUS OF 61,222 FIRST ADMISSIONS TO NEW YORK AND MASSACHUSETTS MENTAL HOSPITALS 1928-1932. NUMBERS AND RATES PER 100,000 OF THE POPULATION FIFTEEN YEARS AND OVER (1930) OF SAME MARITAL STATUS GROUPS

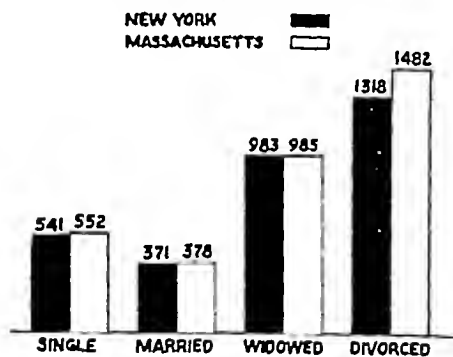
Marital Status	First Admissions, 1928-1932		General Population (15 Years and Over)		Rates per 100,000 Population	
	New York	Massachusetts	New York	Massachusetts	New York	Massachusetts
Total	45,632	15,590	9,435,747	3,122,314	483	499
Single	16,967	6,059	3,136,028	1,097,458	541	552
Married	20,451	6,594	5,500,881	1,740,235	371	378
Widowed	7,081	2,505	720,140	254,285	983	985
Divorced	695	380	52,713	25,630	1,318	1,482
Unascertained	438	52	25,985	4,706		

dinarily provide elements of balance in the mental, physical, emotional and social fields. They have to face the task of depending upon self only, an achievement which man finds

disorder in the patient becomes aggravated and admission to a mental hospital becomes imminent. Again we find the attendant difficulties in being thrown back upon one's own resources. After years of interdependence the aging person who finds himself suddenly alone, faces a grave readjustment problem.

The divorced groups in both states show the highest admission rates of any of the marital groups. In comparison with the married, the divorced in New York have three and a half times the chance of being admitted to a mental hospital. The Massachusetts ratio of 3.8 is even higher. A certain proportion of the divorced may be emotionally unstable or may possess other neurotic traits which make it difficult to preserve the family relationship. The factor of the removal of protection also plays a part. Symptoms minimized by the husband or wife may be thrown into relief once the marriage is terminated. Again, the divorce itself, like the death of the husband or wife in the widowed, may have precipitated an emotional crisis.

MARITAL STATUS OF 61,222 FIRST ADMISSIONS TO NEW YORK AND MASSACHUSETTS MENTAL HOSPITALS 1928-1932. ADMISSION RATES PER 100,000 POPULATION—AGES 15 YEARS AND OVER (1930 CENSUS) OF SAME MARITAL STATUS



GRAPH 1

extremely difficult. The individual who is alone has more of an opportunity to overestimate the significance of happenings that center about himself. The married individual, through the home and family, has many external stimuli which are inimical to the development of introversion. In addition the single, lacking the shelter of the parental home and the protective factors afforded by marriage, are more open to a public inspection of their mental condition, and developing symptoms are quickly discovered.

In the group who marry something very significant happens when the marriage partner is withdrawn through death. While the shock surrounding the death of the husband or wife probably contributes to the development of

The admission rate for the Massachusetts divorced group is 12 per cent higher than that of the New York group. However, differences in the statutes of the states may account for this. The New York law is very rigid, sex delinquencies being the only cause admissible for divorce proceedings while Massachusetts accepts a number of causes. During the period 1928-1932 there were 23,229 divorces in New York, a rate of 246 per 100,000 of the population fifteen years of age and over (1930). The same period in Massachusetts showed 18,151 divorces, or a rate of 581. Proportionately Massachusetts has twice as many divorces as New York. In basing divorce upon adultery alone, New York exercises a rigid selection of cases. Massachusetts probably has a larger proportion of divorces arising through emo-

men including secret societies, churches and other organizations, who have done so much for the general welfare of the community as the medical profession in the past fifty years I dare say, and Dr Wallace will bear witness to this, that I have given to charity about \$1 000 a year. But, I am not going to claim that amount. I am going to estimate that it was \$500. Now, in fifty years that would be \$25 000, and that is quite an item. Somebody owes that amount to me and to Dr Wallace and to those who have done these things.

Now, there is a great cloud before the medical profession today. I can't solve it, it is too deep for me. It is this social medicine. Perhaps it is up to you men to fight it out. We older ones have put up a good fight, and have kept the faith, so now it is up to you to see that it is fought out to the finish because the older ones will pass out of the picture. So we hope that you will continue and fight the thing out and get what justly belongs to the medical profession in years to come.

In closing, I wish to give this little toast to the Society and to each individual.

"Farewell, and if forever, then forever.  
fare thee well."

**PRESIDENT ABBOTT** We have another member of our Society who has practiced medicine for fifty years, but he is unable to be with us today. I am referring to Dr J Franklin Robinson of Manchester. He has, by this time received a letter of congratulation from the Society.

We have with us this afternoon, also, Dr Mary S Danforth of Manchester. She has been a member of the Society for fifty-eight years.

Dr Danforth, won't you please stand up so that we may see you?

[Dr Danforth then rose, and was greeted with a tremendous ovation of applause from the audience.]

**VICE-PRESIDENT KITTREDGE** then assumed the Chair.

**CHAIRMAN KITTREDGE** *Ladies and Gentlemen of the New Hampshire Medical Society*—It is very interesting to me to listen to Dr Wallace, as well as to Dr Hawkins, because during his first three years of the practice of medicine he was a neighbor of mine. I happened to be at that time in Centre Harbor, and he was in Meredith. Needless to say there was competition between us, but it was always friendly. I am one who can always bear witness to the fact that Dr Hawkins has always done his work well.

It is now my pleasure as Vice-President of the New Hampshire Medical Society, to introduce to you the President of the Society, Dr Clifton S Abbott.

Dr Abbott delivered the President's Address. This address was followed by a Symposium on Pediatrics with the following titles and speakers:

a "Medical Aspects"

Richard M Smith, Boston, Assistant Professor of Pediatrics, Harvard Medical School. Discussion opened by Ursula G Sanders, Concord.

b "Surgical Aspects"

William E Ladd Boston, Clinical Professor of Surgery Harvard Medical School. Discussion opened by MacLean J Gill Concord.

c "The Prevention and Modification of Certain Communicable Diseases"

R Cannon Eley, Boston. Discussion opened by Abbott L Winograd, Nashua.

WEDNESDAY MORNING, MAY 27, 1936

The Session convened at ten o'clock in the forenoon.

**PRESIDENT ABBOTT** The meeting will please come to order. We desire this morning to recognize our visiting delegates from our neighboring States. I am going to call upon the State of Maine first.

**DR EARLE RICHARDSON** *Mr President and Members of the New Hampshire Medical Society*—Our officers wish to extend to you all an invitation to attend our Annual Meeting at Rangleev, beginning on Sunday evening, June 21, and continuing throughout the twenty-second, and twenty-third of June.

I enjoyed very much coming up here today. Years ago I taught school in New Hampshire for a year and so I have always had a good feeling toward this State.

I didn't know that I was supposed to say anything. In our State, we are going on in about the same way as most States are.

Last year, at the last Legislature, we got through a two-year law on malpractice suits. There are several bills before the next Legislature, which we are hoping to get through. One of them, which we failed to have passed, was to have a provision for a lien law in accident cases. As you probably know, the lawyer gets the fee and if the doctor and the hospital receive their share, they are lucky. I can think of one case where I lost \$500. A man was up for murder and the lawyer who was representing the defendant came to me before the trial. The defendant was out on bail. He was in an accident and I attended him in the hospital for a considerable number of weeks so I know about this case. The lawyer asked me if I couldn't keep him over an extra week. I didn't understand that he didn't want to have the case come up before a certain judge in the Supreme Court. Anyway, they finally went to trial for

the customary call upon the physicians. Among them was Dr. George Crosby, who was exceedingly kind and gave me most excellent advice and suggestions. But, as I was leaving his office, he said, "Now, you must go out for yourself." I replied, "I cannot do it, Doctor." His answer was, "Then go back to Concord and stay there."

We have heard a great deal, and we all know that there have been great advances in medicine and surgery during the last fifty years. There have been as great advances in preventive medicine.

In college, we had an excellent professor in hygiene, and I became very much interested in the subject. The tubercle bacillus had been discovered but a short time before, and everybody was very hopeful with enthusiasm for the preservation of life which previously had been doomed. The District Nursing Association, one of the first of such agencies in America, was established a short time before that. I boarded in the home with the nurses, making, during my postgraduate work, many calls with them.

At that time, there were practically no articles in newspapers or magazines in regard to health.

When I returned to New Hampshire, the doctors were still treating their consumptive patients with sedative cough mixtures, and telling them they had chronic bronchitis.

The common drinking cup was used in churches, schools and on railroad trains. Milk inspection was a political job, the work, as a rule, being only to issue the annual census. There was not a public health nurse in the State.

Here was a wonderful opportunity for pioneer work, I approved of it, and practiced according to the best of my ability and with all the spare time I could take from my general practice.

Were you to ask me today, if I could live my life over again, and knowing what I do, would I study medicine, my answer would be, "I surely would."

I believe there is nothing that can give more satisfaction than to know how to relieve suffering and perhaps save life.

Furthermore, I would join the New Hampshire Medical Society.

PRESIDENT ABBOTT: Thank you Dr. Wallace.

It is my great pleasure to present my neighbor, Dr. Frederick L. Hawkins, who has practiced medicine for fifty years but who, unfortunately, has not been a member of the Society for fifty consecutive years so he does not get a medal.

DR. FREDERICK L. HAWKINS: My President and Members of the New Hampshire Medical

Society—Some three weeks ago, I got a letter from the Secretary, summoning me to appear before this body and to show cause for my having continued to practice medicine for fifty years.

I shall have to plead guilty, of course, that I have done this, but I didn't see what ground he had for his question, or what he had to do about it anyway, or what business it was of him.

He said that I had practiced medicine for fifty years. I can only recall that one Sir William Osler said that after the physician got to be sixty years old, he ought to be chloroformed. I thought that was rather a serious business for me. But I have in my favor, for a reply, that Sir William did not take his own medicine, he lived for three score years and then, died a natural death. So I have that for my argument as to why I should stand up for my cause.

Perhaps another plea would be that I didn't intend to do this. Fifty years, to you younger men and women, mean a whole lot. When I was twenty-five years in practice, I thought it would be my goal to practice that long and to save a thousand dollars each year, then I was going to have a house by the side of the road, perhaps by the side of Lake Winnepesaukee, and I was going to fish and hunt the rest of my days.

But, when the twenty-five years were up, I didn't make the grade. I didn't have the \$20,000, notwithstanding that I had earned it. Some other fellow got it, because I didn't.

Perhaps I might be classified as a self-satisfied physician. I went into a little town fifty years ago this month, and I stayed in that little town all the time. I know all the people there, from the father and mother to the grand father and grandmother, and I don't have to go into the family history of any of them to know about them. I keep no records except those in my head.

I was satisfied with everything that came along. In those years, I have been through the snowshoe stage of transportation, down through the horse and buggy, the bicycle and the automobile stages. I have visited my patients on snowshoes. Many of you men probably never drove a horse, so you don't know what an amazing thing it was to do, to sit behind a good horse, chirp to him and get over the ground. You men today are regular hothouse plants. You have all these closed cars to protect you from the lightning and the rain. We had to go through all kinds of weather. Today, you sit in an automobile, which is shielded from the wind and the weather, with a heater inside of it and it is like sitting in your own home.

We hear a great deal about the welfare question. To my mind there is no man or body of

But, I wish you all to know that I shall make every effort so far as my strength and ability permit, to fulfill my obligations to the New Hampshire Medical Society

PRESIDENT ABBOTT Dr Metcalf is going to give us a condensed report of the House of Delegates

SECRETARY METCALF One of our officers Dr Arthur T Downing of Littleton, New Hampshire, is very ill, and may not recover At the suggestion of the President, and with your approval, I am sending him the following telegram

'The New Hampshire Medical Society now in session, in appreciation of your high standards of practice and devoted service to medicine in New Hampshire, sends you its greetings and best wishes'

The House of Delegates, during its recent sessions, has done the following things

The meeting of this Society next year will probably be held on daylight saving time We are planning to have one morning, if suitable accommodations can be obtained, devoted to round table discussions, instead of to the ordinary platform addresses

The House of Delegates voted to co operate with the State Board of Health in promoting the medical phases of the Social Security Act This does not mean sickness insurance, or State medicine, but just those phases which relate to crippled children, to welfare and to the improvement of the public health services

There were two or three reasons why the House of Delegates made this decision The first reason is that this plan is going through any way The second reason is that the federal government has been rather more friendly in the matter than some of us anticipated, and seemed to want these medical phases to be managed by doctors, rather than by laymen This being the case, it seemed to the House of Delegates better, not only for the patient, but for the Society itself, to be on the inside The Committees of our Society now in existence are going to function in an advisory and in an executive capacity in this set-up

The Committee on Public Relations was authorized if and when it becomes necessary to secure a paid legislative representative

The Committee on Public Relations, with the co-operation of the Committee on Tuberculosis was advised to procure, if possible additional beds at the Tuberculosis Sanatorium at Glen cliff, which is now much overcrowded

Several months ago, the insurance companies approached me with the request that the State Medical Society should formulate a fee schedule to be used in compensation cases That matter was referred to the several county societies, and

it has now been referred to the Committee on Medical Economics, with the request that that Committee shall report at the future meeting of the House of Delegates as to the advisability of having or not having such a fee schedule

The House of Delegates asked me to remind you that *The New England Journal of Medicine* may be obtained throughout the year, the fifty-two copies, for \$3 The New Hampshire Medical Society pays for each of its members \$1 a year, for which each member receives twelve copies, for \$3 more you may have the other forty copies, and this is virtually half price

The services of the Speakers' Bureau have been lent to the Women's Auxiliary The Secretary of the Auxiliary approached me and said that they would like to arrange meetings among women's clubs, among the League of Women Voters and such organizations, where it might be desirable to give medical addresses We told them that we would furnish the doctors, if they would arrange the meetings

Your new Vice President is Dr Samuel T Ladd of Portsmouth

I wish also to report a case of nepotism I am told that the next President of the Auxiliary is Mrs Carleton R Metcalf

PRESIDENT ABBOTT Dr Thomas W Luce will now give you the report of the Trustees of our Society

#### REPORT OF THE TRUSTEES OF THE NEW HAMPSHIRE MEDICAL SOCIETY

For the Year Ending May 1, 1936

##### RECEIPTS

December 16, 1935—A liquidating dividend of 5% from the Merrimack River Savings Bank. This was deposited in the Portsmouth Trust and Guarantee Co Book No 12813	\$91 70
April 14 1936—A check from the Treasurer for the General Fund This was deposited in the Nashua Trust Co Book No 41382	\$1 000 00

##### EXPENDITURES

August 12 1935—Paid Dr D G Smith by check on the Portsmouth Trust and Guarantee Co This for his expenses as a delegate to the meeting of the A M A	\$76 49
May 1 1936—Paid Dr John D Spring from the Burnham Fund This for his essay entitled Artificial Pneumothorax in the Treatment of Tuberculosis	\$50 00

##### SPECIAL FUNDS

###### *The Bartlett Fund*

Deposit in the Portsmouth Savings Bank Book No 21110 The original bequest (\$352 11) is to be kept as a permanent fund	\$5 802 04
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the accident case before the murder case came up and the man got a verdict of \$2500. The lawyer took it all and I got nothing. I have been unable to collect a thing.

We are trying to get through in the next Legislature a law which will protect doctors and hospitals.

Again, I want to thank you for your courtesy, and to tell you that I have enjoyed coming here as a delegate.

PRESIDENT ABBOTT Are there any other delegates here this morning?

DR GASLON of Connecticut *M, President, Members of the New Hampshire Medical Society, and Visiting Delegates*—It is not only a great pleasure, but it gives me a great deal of personal pride and satisfaction to be able to be present today and to bring to this Scientific Body the greetings and good wishes of the Connecticut State Medical Society.

In reviewing the program I should say that your Program Committee should be congratulated upon the unique quality and breadth of the scientific papers. I feel that each member departing from these sessions will return to his or her practice with a clearer conception and a better understanding of the subjects discussed during the Scientific Sessions.

Gentlemen, on behalf of the Connecticut State Medical Society, I wish to thank you for your kindness and your courtesy to me during my brief visit with you.

PRESIDENT ABBOTT Are there any other delegates present?

I believe Dr Tabor of Lowell is one of the delegates from Massachusetts, and it is a pleasure to call upon him at this time.

DR. TABOR of Lowell, Massachusetts It is a great pleasure to be here, Ladies and Gentlemen, and I wish to take this opportunity to extend to you the greetings of the Massachusetts Medical Society.

The program for this session was as follows:

"Problems in the Diagnosis and Treatment of Bronchiectasis" M Dawson Tyson, Hanover. Discussion opened by Robert M Deming, Glenciff, and Leslie K Sycamore, Hanover.

"More Rational Methods in the Prevention and Control of Eclampsia," J O Arnold, Philadelphia, Professor of Obstetrics, Temple University. Discussion opened by Benjamin P Burpee Manchester, and Robert O Blood, Concord.

"Public Relations of the Medical Profession," Morris Fishbein, Chicago, Editor, *Journal of the American Medical Association*.

WEDNESDAY AFTERNOON, MAY 27, 1936

The Session convened at 2 00 p m, with President Abbott presiding.

PRESIDENT ABBOTT The meeting will please come to order.

Members of the New Hampshire Medical Society, I wish to present your new President, Dr Frank E Kittredge, at this time.

PRESIDENT-ELECT KITTREDGE *M, President, Ladies and Gentlemen*—I wish to thank you for the feelings which you apparently have toward me, as evidenced by your applause.

I wish also to thank you for the honor you have conferred upon me at this time. It is, indeed, an honor, for any medical man to be elected President of his State Society, whether in New Hampshire or any other state.

The Presidency of the State Society of a comparatively few years ago was a much different responsibility than it is today. At that time, all he had to do was to preside at the State meetings for a couple of days, don his dress suit on the evening of the first day, stand in line and receive his guests, and incidentally pay for the refreshments, deliver his address the next day, and say something, possibly, at the banquet in the evening.

But today, the Presidency of the State Society is quite a different proposition.

The New Deal is ringing our front door bells, while its handyman is endeavoring to enter the back door or the window, in the guise of socialized or state medicine. All of these movements require the utmost vigilance on the part of the officers of your Society, otherwise, we would very soon lose our rights, our liberty and our self-respect as practitioners of medicine. In no other way could we care for our patients with the requisite amount of scientific and sympathetic care that they are entitled to receive, and desire to have.

I attended a meeting of the House of Delegates of this Society on Monday evening. It was the first meeting of that body that I had ever attended. I was amazed at the amount of work that was accomplished there. It was a meeting that lasted well after midnight, and the delegates were all prompt in arriving at the appointed hour. You can imagine what they went through in the way of reports, and laying out work for the coming year.

I can visualize from that meeting just what is expected of the President during this coming year, with committee meetings, legislative proceedings, attending county meetings at least once a year. And my predecessor, Dr Abbott, has kindly informed me that I am expected to prepare an address now and then. So I am inclined to think that I shall have a very busy year.

**CASE RECORDS**  
*of the*  
**MASSACHUSETTS GENERAL  
HOSPITAL**

ANTE MORTEM AND POST MORTEM RECORDS AS USED  
IN WEEKLY CLINICAL PATHOLOGIC EXERCISES

FOUNDED BY RICHARD C CABOT, M.D

TRACY B MALLORY, M.D., *Editor*

CASE 22301

PRESENTATION OF CASE

*First Admission* A thirty year old Canadian entered complaining of weakness and shortness of breath

Thirteen years before admission he was turned down by the Army for a "leaky heart valve." He noticed no symptoms at that time although he had always been tired. Since then however he had noticed irregularity of his heart after a hard day's work or a hard night's drinking. He continued at hard manual work and enjoyed swimming. Thirteen months before admission after a drinking bout, he had a sensation of substernal discomfort with a rapid irregular heart. He could not get his breath and felt weak. He entered a hospital for one week and then remained at home in bed for three months during which time he was slightly orthopneic. At the end of this period he got up for a walk but became markedly dyspneic and developed a cough which was productive of a cupful of blood and, during the next few days blood streaked sputum. He was forced to sleep in a chair during the next month. Eight months before admission he developed a pleural pain in the right chest and since then had had it intermittently, often aggravated by colds. He had been on digitalis off and on. A few months later he had an acute attack of apparent decompensation with nausea, vomiting and severe orthopnea and became very tired and exhausted. A physician treated him with digitalis and morphia. Since then he had lived a very restricted life.

His father and mother were living and well. Seven siblings were living and well. Eight had died, all before one year of age, of unknown causes.

His wife died seven years ago of pulmonary tuberculosis.

The past history is non-contributory. There was no history of rheumatic fever, chorea or sore throats. He had gonorrhea four times, the last attack two and a half years before admission.

Physical examination showed a well devel-

oped and poorly nourished young man. His fundi showed slightly tortuous arteries and engorged pulsating veins. His tonsils were large but not inflamed. His heart was markedly enlarged and showed a heaving impulse. The left border of dullness was 10 centimeters from the midsternal line, about 5 centimeters outside the midclavicular line. The right border was 5 centimeters from the midsternal line. There were systolic thrills at the apex and base. In addition there was a rough blowing systolic murmur at the apex transmitted to the axilla and also an apical diastolic murmur. At the base there were to-and-fro murmurs, the systolic very rough and transmitted to the neck.  $P_2$  was loud but both murmurs were heard in the pulmonary area. The rate was fairly irregular and at times there were numerous extrasystoles. The liver was felt two fingerbreadths below the right costal margin. The spleen was not felt. There were no petechiae. The chest was clear except for a right pleural friction rub. The blood pressure was 140/48.

The temperature was 96.5°, the pulse 60. The respirations were 20.

Examination of the urine was negative. The blood showed a red cell count of 4,700,000 with a hemoglobin of 60 per cent. The white cell count was 10,000, 67 per cent polymorphonuclears. A Hinton test was negative. An electrocardiogram showed auricular fibrillation, rate 60 to 70 and inverted  $T_2$  and  $T_3$ .

He remained in the house for approximately two weeks, receiving digitalis and was discharged to be followed in the Out Patient Department.

*Second Admission*, two years later.

Following discharge he remained in bed for two months and then did quite well on a very restricted régime taking from 1½ to 4½ grains of digitalis daily. One week before admission he suddenly had a hemoptysis of five or six teaspoonfuls of dark red blood which was followed an hour later with more blood. Since then he had much dyspnea, orthopnea and palpitation. During the past few days he had a cold with a fever of 104°.

Physical examination showed the patient to be in slight respiratory distress. There were several small petechiae in both conjunctivae and a questionable splinter hemorrhage under one fingernail. The heart was enlarged. There was a presystolic thrill at the apex and a well-marked systolic thrill at the base transmitted up into the neck. There were also a well-marked mitral diastolic roll at the apex with a softer systolic blow and a very harsh systolic murmur over the aortic area with a softer diastolic blow.  $A_2$  was absent.  $P_2$  came through only occasionally and was then accentuated. There was a pistol shot sound and systolic murmur over the brachial arteries. The pulse was

*The Pray Fund*

Deposit in the Strafford Savings Bank  
Book No A 42 \$1 000 00 of this  
must be kept permanently, the in-  
come to be expended for prize essays 1,391 88

*The Burnham Fund*

Deposit in the New Hampshire Savings  
Bank Book No 80106 \$1,140 00 of  
this must be kept permanently, the  
income to be expended for prize es-  
says \$50 00 has been drawn out for  
this use in 1936 1 963 22

*The Benevolence Fund*

Deposit in the New Hampshire Savings  
Bank Book No 99559 This fund is  
to be allowed to accumulate until  
it totals \$10 000 00 1 174 95

*The General Fund*

Deposit in the Portsmouth Trnst &  
Guarantee Co Book 12813 3 225 13  
Deposit in the New Hampshire Savings  
Bank Book No 35696 5 061 89  
Deposit in the Nashua Trust Co Savings  
Dept Book No 4382 1,512 87

Total Funds on Deposit \$20,131 98

## FUNDS NOT FOR GENERAL USE

The Bartlett Fund \$352 11  
The Burnham Fund 1,963 22  
The Pray Fund 1 391 88  
The Benevolence Fund 1 174 95  
\$4 882 16

## Present Funds available for General

Use \$15 249 62

Funds available for General Use

May 1 1935 13 810 16

Net Gain for the Year \$1 439 66

The balance due the Society from the Merrimack  
River Savings Bank (Book No 26934) in process  
of liquidation is \$641 88 Your Trustees regard  
this of little value

The accounts of the Treasurer have been exam-  
ined and found to be correctly cast and properly  
vouched

(Signed) THOMAS W LUCE,  
HENRY O SMITH

The program concluded as follows

"Recent Advances in Urologic Surgery, In-  
cluding Renal and Prostatic Surgery Experi-  
ences with a New Operation for Impotence"  
Oswald S Lowsley, New York City Discussion  
opened by Elmer J. Brown, Manchester, Rich-  
ard W Robinson, Laconia

"Coronary Disease, Including Angina Pec-  
toris," William D Stroud, Philadelphia, Profes-  
sor of Cardiology, University of Pennsylvania  
Medical School Discussion opened by Gran-  
ville E Hoffses, Manchester, and Harry T  
French, Hanover

## CLIPPINGS FROM THE BULLETIN OF THE PUBLIC RELATIONS BUREAU MEDICAL SOCIETY OF THE STATE OF NEW YORK

First incubator patent was issued December 27,  
1870 to Jacob and Henry Graves of Boston Mass

It is better to be fat than dead said Carl Malm-  
berg in his book called 'Diet and Die' He cites in-  
stances of well known persons who have food fattened  
themselves into their graves

Warm weather and the increase of opportunities  
for recreation present certain dangers arising from  
overexertion at the outset especially for adults  
American life is characterized by too much haste  
in the activities of making a living—why carry this  
attitude over into the vacation days? Fathers  
should not attempt to keep pace with their young  
sons A first aid kit should always be taken on va-  
cations Immediate treatment should be given cuts  
and bruises When wounds are caused by rusty  
nails or similar objects a child should be taken at  
once to a physician

Nobody catches typhoid fever — he swallows it

Watch the sources of your water supply when you  
go camping

Carelessness is the leading cause of death by  
drowning Foolhardy stunts' swimming in water  
which is too deep trying to 'show-off' contribute  
to the death toll It is easy to learn to swim, every-  
one should know how

There is no such thing as racial superiority, each  
type runs the gamut from idiots to geniuses and  
from criminals to philanthropists according to Prof.  
Earnest A. Hooten of Harvard University

DR. FOSTER KENNEDY SAID

Shakespeare was not a psychoanalyst George  
Moore and Thomas Hardy were not psychoanalysts  
but I venture to say that their understanding may  
be better than our knowledge

Do identical twins think the same thoughts at the  
same time? Not necessarily but they have identi-  
cal patterns of brain activity Electrograms of the  
brains of eighteen sets of identical twins proved  
this to Dr Hallowell Davis and Dr Pauline A Davis  
of Harvard Medical School

CASE RECORDS  
of the  
MASSACHUSETTS GENERAL  
HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED  
IN WEEKLY CLINICAL PATHOLOGIC EXERCISES

FOUNDED BY RICHARD C CABOT, M D

TRACY B MALLORY, M D, *Editor*

CASE 22301

PRESENTATION OF CASE

*First Admission* A thirty year old Canadian entered complaining of weakness and shortness of breath

Thirteen years before admission he was turned down by the Army for a "leaky heart valve". He noticed no symptoms at that time although he had always been tired. Since then however he had noticed irregularity of his heart after a hard day's work or a hard night's drinking. He continued at hard manual work and enjoyed swimming. Thirteen months before admission after a drinking bout, he had a sensation of substernal discomfort with a rapid irregular heart. He could not get his breath and felt weak. He entered a hospital for one week and then remained at home in bed for three months during which time he was slightly orthopneic. At the end of this period he got up for a walk but became markedly dyspneic and developed a cough which was productive of a cupful of blood and, during the next few days, blood streaked sputum. He was forced to sleep in a chair during the next month. Eight months before admission he developed a pleural pain in the right chest and since then had had it intermittently, often aggravated by colds. He had been on digitalis off and on. A few months later he had an acute attack of apparent decompensation with nausea, vomiting and severe orthopnea and became very tired and exhausted. A physician treated him with digitalis and morphia. Since then he had lived a very restricted life.

His father and mother were living and well. Seven siblings were living and well. Eight had died, all before one year of age, of unknown causes.

His wife died seven years ago of pulmonary tuberculosis.

The past history is non contributory. There was no history of rheumatic fever, chorea or sore throats. He had gonorrhea four times, the last attack two and a half years before admission.

Physical examination showed a well-devel-

oped and poorly nourished young man. His fundi showed slightly tortuous arteries and engorged pulsating veins. His tonsils were large but not inflamed. His heart was markedly enlarged and showed a heaving impulse. The left border of dullness was 10 centimeters from the midsternal line, about 5 centimeters outside the midclavicular line. The right border was 5 centimeters from the midsternal line. There were systolic thrills at the apex and base. In addition there was a rough blowing systolic murmur at the apex transmitted to the axilla and also an apical diastolic murmur. At the base there were to and fro murmurs, the systolic very rough and transmitted to the neck. P<sub>2</sub> was loud but both murmurs were heard in the pulmonary area. The rate was fairly irregular and at times there were numerous extrasystoles. The liver was felt two fingerbreadths below the right costal margin. The spleen was not felt. There were no petechiae. The chest was clear except for a right pleural friction rub. The blood pressure was 140/48.

The temperature was 96.5°, the pulse 60. The respirations were 20.

Examination of the urine was negative. The blood showed a red cell count of 4,700,000 with a hemoglobin of 60 per cent. The white cell count was 10,000, 67 per cent polymorphonuclears. A Hinton test was negative. An electrocardiogram showed auricular fibrillation, rate 60 to 70, and inverted T<sub>2</sub> and T<sub>3</sub>.

He remained in the house for approximately two weeks, receiving digitalis, and was discharged to be followed in the Out Patient Department.

*Second Admission*, two years later

Following discharge he remained in bed for two months and then did quite well on a very restricted régime taking from 1½ to 4½ grams of digitalis daily. One week before admission he suddenly had a hemoptysis of five or six teaspoonfuls of dark red blood which was followed an hour later with more blood. Since then he had much dyspnea, orthopnea and palpitation. During the past few days he had a cold with a fever of 104°.

Physical examination showed the patient to be in slight respiratory distress. There were several small petechiae in both conjunctivae and a questionable splinter hemorrhage under one fingernail. The heart was enlarged. There was a presystolic thrill at the apex and a well-marked systolic thrill at the base transmitted up into the neck. There were also a well-marked mitral diastolic roll at the apex with a softer systolic blow and a very harsh systolic murmur over the aortic area with a softer diastolic blow. A<sub>2</sub> was absent. P<sub>2</sub> came through only occasionally and was then accentuated. There was a pistol shot sound and systolic murmur over the brachial arteries. The pulse was

Corrigan in type. The blood pressure was 130/50. The rhythm was absolutely irregular but showed no deficit. The lungs were clear. The spleen was easily felt two fingerbreadths below the left costal margin. The liver was not felt.

The temperature was 99.5°, the pulse 80. The respirations were 22.

Examination of the urine was negative. The blood showed a red cell count of 5,500,000, with a hemoglobin of 80 per cent. The white cell count was 6,100, 46 per cent polymorphonuclears, 35 per cent lymphocytes and 15 per cent mononuclears. Three blood cultures were negative.

While in the hospital no more petechiae appeared. On the fifth day the patient suddenly awakened at 3:00 a. m. with pain and numbness in the left arm below the elbow. Examination showed that the pulse on that side was weaker than on the right and there was a definite level about two inches above the hand on the wrist beyond which the hand was cold and clammy. After the application of heat, however, the pain was somewhat relieved and during the next few days became very much better. There was no further change in his condition and he was discharged two and a half weeks after admission.

#### *Final Admission, two years later*

He did quite well on a very limited régime until one year before admission when he began having ankle edema and severe orthopnea. Six months before admission he returned to bed but could not sleep lying down. He led a bed and chain existence during this period but for the past three months his signs and symptoms increased in severity. There was, however, no nausea, vomiting, fever or pleural pain.

Physical examination showed a very sick, cyanotic, orthopneic man. No petechiae were seen. There were moist râles at both bases, especially at the right. The heart was enlarged to the right and to the left. There was slow fibrillation but no pulse deficit. The cardiac findings were similar to those of his previous admission. The heart was 4.5 centimeters outside the mid-clavicular line. The spleen was felt two fingerbreadths below the left costal margin. There was massive edema of the lower extremities and sacrum. During his stay in the hospital several examiners could not feel the spleen.

He was kept on digitalis but gradually went downhill showing no evidence of bacterial endocarditis, and died three weeks after admission.

#### DIFFERENTIAL DIAGNOSIS

DR. F. DANFETTE ADAMS. The history of this man's illness is typical of the slowly but definitely progressing case of rheumatic heart dis-

ease, with presenting symptoms lasting for five years, and one symptom, cardiac irregularity covering a much longer period. Heart disease at seventeen is most likely of the rheumatic type. The absence in his past history of any of its usual etiologic factors does not exclude rheumatic heart disease, particularly if there is convincing evidence of the presence of this condition. The fact that he had been refused admission to the army because of a "leaky heart" cannot be disregarded. Periodic attacks of rapid heart occurring at this age are due usually to paroxysmal auricular tachycardia, auricular flutter, or paroxysmal auricular fibrillation. Since irregularity was noted by the patient, the disturbance in rhythm was due probably to premature beats or paroxysmal auricular fibrillation. Such attacks, especially the latter, are apt to be associated with fatigue, and to follow alcoholic excesses. Substernal discomfort always suggests coronary disease, but it also accompanies these sudden disturbances of rhythm.

The first serious episode of congestive failure occurred over a year prior to the initial admission and five years before death. It was precipitated by heavy drinking. Improvement was slow, and even after three months of bed rest the patient's first attempt at activity brought on dyspnea and hemoptysis. Frank hemoptysis, if due to rheumatic heart disease, usually indicates mitral stenosis. It may be a sign of active rheumatic infection. A fairly extensive pulmonary embolus arising from a thrombus in the right auricle could give rise to similar symptoms, but they would probably be accompanied by severe pain of pleuritic type and signs of acute collapse.

The sequence of events following the initial attack of failure is characteristic of the chronic rheumatic heart case. The man remained a cardiac invalid until his death five years later, episodes of complete incapacity alternating with periods of relative improvement, but there was never freedom from symptoms and his reserve steadily diminished. He had all of the cardinal signs: dyspnea, orthopnea, palpitation, and edema. The nausea and vomiting were doubtless due to congestion of the liver or stomach, possibly to excess of digitalis.

In contrast to the rheumatic case, the patient with syphilitic or arteriosclerotic heart disease, once failure has set in, shows a more rapid decline, and does not have so many periods of relative improvement. There is nothing in the history to suggest hypertensive, hyperthyroid or congenital heart disease.

The fatigue experienced by this man during the earlier stages figures more prominently than is usual for the organic heart case. Characteristically, the patient with organic heart disease complains of general fatigue in association with failure—not earlier. Not so with the functional

cardiac or the effort syndrome case, here the patient is always tired

The alleged pleural pain in the right chest is not easy to explain. It is seen recurring with the ordinary head cold or upper respiratory infection but not commonly. It does not occur with passive congestion of the lungs, which because of associated cough is often wrongly interpreted as a "cold" or bronchitis. Pulmonary embolism can produce pleural pain but this is acute, not chronic, pain.

The report of the cardiac findings on the first admission is somewhat confusing. There was apparent enlargement of both sides of the heart. A systolic thrill at the apex is not common. One is justified in questioning the correctness of the observer's timing and wondering whether this thrill might not have been of the presystolic variety. The character and timing of the apical diastolic murmur might also have been noted. This should not be difficult with a heart rate of 60 although it might be impossible if the heart were rapid. It is unfortunate that there is no mention made of the character of the first sound. A sharp snapping first sound at the apex is a valuable sign of mitral stenosis.

Despite the absence of these important particulars of information, it seems to me that what evidence is presented regarding apical signs points to the presence of mitral stenosis and insufficiency.

A basal systolic thrill is almost pathognomonic of aortic stenosis. The rough systolic murmur at the base is further evidence of this lesion and the basal diastolic murmur indicates aortic insufficiency. Aortic murmurs, especially if loud, are often heard in the pulmonic area, so their presence in this region is not necessarily indicative of pulmonic valve involvement.

The loud  $P_2$  is explainable on the basis of increased pulmonic pressure due to delay in the left side of the heart. I do not know why the  $P_2$  should have failed to come through with all beats. Auricular fibrillation with a rapid rate and many feeble beats might account for it. This patient, however, had a slow rate and probably, even if fibrillating, was not having many weak beats. No mention is made of a pulse deficit.

The aortic second sound is not mentioned. It may have been absent because of fixation or retraction of valve leaflets. The low diastolic blood pressure and relatively high pulse pressure are added indications of aortic insufficiency. With marked aortic stenosis the pulse pressure is usually small, the diastolic apt to be normal. So, if stenosis was present as it must have been in this case, it could not have been very marked. The irregularity of rhythm was apparently wrongly interpreted on physical examination; the electrocardiogram showed

fibrillation. It is not always easy to distinguish by physical examination between the irregularity due to frequent premature beats and that of auricular fibrillation. Passive congestion of the liver probably accounts for the palpability of its edge.

The laboratory findings contributed nothing of importance. The inversion of the  $T_2$  and  $T_3$  waves in the electrocardiogram could best be accounted for by digitals, if the patient had been getting large doses or by right ventricular hypertrophy. Fluid in the pericardial sac is a less likely, but a possible explanation. There is no mention of right or left axis deviation, both sides of the heart probably being hypertrophied—another bit of evidence in favor of a combination of mitral and aortic valve involvement. With mitral stenosis P waves are usually increased, but this patient was fibrillating so he had no definite P waves.

At the time of the second admission the patient showed petechial spots in the conjunctivae and a questionable splinter hemorrhage under one fingernail. In a known cardiac case these would suggest subacute bacterial endocarditis, but their presence in this man is counterbalanced by the absence of much fever and of anemia. Subacute bacterial endocarditis shows rises of temperature greater than the  $99.5^\circ$  given on this chart. As a matter of fact the probability of this being a rectal reading is suggested by the patient's dyspnea and  $99.5^\circ$  by rectum would be considered normal. It is not possible, then, to account for these petechiae.

Three negative blood cultures do not exclude subacute bacterial endocarditis. Often many more are taken before a growth is obtained.

In this report of the second admission we find more conclusive evidence of mitral stenosis in the presystolic thrill at the apex and the diastolic rolling murmur. The pistol shot sound over the brachial arteries and the Corrigan pulse are corroborative evidence of the presence of aortic insufficiency. It is surprising that a Corrigan pulse should have been felt with the pulse pressure of 80. Usually a wider spread or at least a much lower diastolic pressure is required before this phenomenon can be observed.

Why the spleen should have been enlarged on the second admission and the liver no longer palpable is inexplicable. If due to congestion one would expect the liver to be still enlarged, not to have receded. Embolus to the spleen is a possibility especially in view of what happened to the arm but we lack the history of pain in the left side characteristically experienced at the onset of splenic embolism.

The episode of pain, numbness and circulatory change in the arm was undoubtedly due to embolism. There were two possible sources of embolus: first thrombus in the left auricle,

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The episode of pain, numbness, and circulatory change in the arm was undoubtedly due to embolism. There were two possible sources of embolus: first thrombus in the left auricle,

second, but much less likely, vegetation breaking off from an active lesion on the aortic or mitral valve

DR BENJAMIN CASTLEMAN It would have to be quite a large embolus from a lesion of subacute bacterial endocarditis

DR ADAMS Yes I do not believe it was from such a source Emboli of bacterial endocarditis disease are smaller

Two years later the man returned again reporting that he had been doing quite well for a year following his last hospital visit

It is surprising how long some of these advanced rheumatic heart cases live Judging from the report of his condition at the previous admission, one would certainly not have given him two more years of life Once congestive failure had set in the syphilitic or arteriosclerotic case would rarely last this long But the rheumatic case often does

On this last admission the patient was much more gravely ill than heretofore, all cardiac reserve having apparently been exhausted Pulmonary and peripheral edema were present The impalpability of the liver at this time provokes speculation why should it not be palpable now, with this degree of congestive failure, when four years earlier it *was* palpable? The palpability of the spleen was questionable

In recapitulation, then the history and course of the disease are typical of rheumatic heart disease with congestive failure The physical findings point toward mitral and aortic regurgitation and stenosis Terminally, there was chronic passive congestion sufficient to cause, in addition to peripheral edema, possibly hydrothorax and hydropericardium Autopsy probably showed a thrombus in the left auricle, possibly in the right We have only one urine report, that obtained on the first admission There should have been passive congestion in the kidneys and of course, in the lungs and other organs There is nothing to suggest subacute bacterial endocarditis or acute rheumatic infection

#### CLINICAL DIAGNOSES

Rheumatic heart disease with mitral and aortic stenosis and regurgitation  
Myocardial failure  
Auricular fibrillation

#### DR F DENNETTE ADAMS' DIAGNOSES

Rheumatic heart disease with aortic stenosis and insufficiency and mitral stenosis and insufficiency  
Hypertrophy and dilatation of the heart  
Generalized anasarca  
Generalized chronic passive congestion  
Chronic pleuritis right?  
Thrombus in the left auricle?  
Thrombus in the right auricle?

#### ANATOMIC DIAGNOSES

Rheumatic heart disease  
Endocarditis chronic rheumatic, with mitral and aortic stenosis and fibrosis of the ventricular endocardium  
Aortic stenosis, calcareous  
Cardiac hypertrophy  
Pulmonary infarct  
Rheumatic pneumonia?  
Pulmonary arteritis, acute, ? rheumatic  
Congestion, chronic passive, of the spleen, liver and lungs  
Aortitis, rheumatic  
Pericarditis, acute fibrinous  
Pleuritis, acute fibrinous  
Peritonitis, acute fibrinous  
Pleuritis, chronic fibrous, right

#### PATHOLOGIC DISCUSSION

DR CASTLEMAN The heart was quite large, weighing 775 grams The hypertrophy was on both sides, and especially marked on the right The right ventricular wall measured eight millimeters, which is three times the normal size, and with a wall of that thickness you would expect to find, of course, stenosis of the mitral valve He had marked stenosis, thickening and calcification of the mitral and aortic valves In addition to an old process, the aortic also showed acute deposits

The cavities of the heart, on the other hand, did not show any mural thrombi at this time That does not exclude the possibility that they may have been present two years before when he had embolic phenomena

DR ADAMS I thought if one got there it usually stayed

DR CASTLEMAN The whole thrombus breaks off sometimes There was no evidence of subacute bacterial endocarditis, and no evidence of any disease on the right side of the heart Sections of the heart showed several Aschoff bodies

The lungs, on the other hand, were very interesting They showed, of course, marked chronic passive congestion, and, in addition, numerous hemorrhagic areas scattered throughout both lungs, a condition that has been called rheumatic pneumonia Histologically, the alveoli are atelectatic or filled with blood Occasionally, they show organizing pneumonia The arterioles throughout the lung showed marked intimal proliferation, a finding common in rheumatic heart disease with stenosis of the mitral valve Some of the larger arterioles showed partial necrosis of their walls with deposits of fibrin and polymorphonuclear leukocytic infiltration This necrosis which was characteristically in the media was found in both patent and obliterated vessels There were also

one or two small hemorrhagic infarcts which I think were not embolic but a localized thrombosis in the lung

A PHYSICIAN Were those infarcts in the right lung or on both sides? It was on the right side that he had the pain two years previously

DR CASTLEMAN The infarcts were on the left. He also had an acute pleuritis in both pleural cavities with just a small amount of fluid, a finding that one could not possibly detect clinically and, furthermore, an increased amount of fluid in the pericardial cavity. The aorta throughout showed what has been described as rheumatic aortitis, a condition that is sufficiently similar to syphilitic aortitis to be occasionally confused with it. There was focal destruction of the media and the vasa vasorum were often surrounded by lymphocytes. The liver showed marked chronic passive congestion. The kidneys showed slight passive congestion.

## CASE 22302

### PRESENTATION OF CASE

A thirty-nine year old Russian housewife was admitted complaining of a lump in the left side of the neck.

The patient had been well until four years ago when she began to have headache and malaise. She was pregnant at this time and, since she was found also to have high blood pressure, labor was induced at the end of the fourth month of pregnancy. Thereafter she became quite nervous and at monthly intervals had attacks of watery diarrhea lasting for two to three days. She became emotionally unstable and often cried at the slightest provocation. There was frequent palpitation associated with the spells of nervousness. About five months before entry a physician discovered a painless lump in the left side of her neck. Subsequently she noted that this became slightly larger transiently during her menstrual periods. A basal metabolic rate was said to be  $-9$  and she was given some thyroid extract. This was discontinued, however, because of increase of nervousness. For three weeks before coming to the hospital she felt very weak, listless, and was unable to carry on her household tasks. The catamenia had begun at sixteen years and were always irregular. The menses recurred at intervals of two to three months and the flow was quite scanty. She had been married eighteen years and had three children. There were no miscarriages.

Physical examination showed a well-developed and nourished woman in no acute discomfort. The skin was normal but there was an abundant localized growth of hair in the lumbosacral region. There were no abnormal eye

signs. Both lobes of the thyroid were palpable. The right was not increased in size or consistency. The left however, was firm, smooth and enlarged to 3 by 4 by 2 centimeters. Immediately adjacent to it were a few firm, nontender, discrete nodes with a few large nodes lying beneath the left sternomastoid up to its cranial attachment. The heart was normal and the lungs clear. The blood pressure was 150/90. The remainder of the examination was essentially negative.

The temperature was  $99^{\circ}$ , the pulse 90. The respirations were 20.

Examination of the urine was negative. The blood showed a red cell count of 4,900,000, with a hemoglobin of 80 per cent. The white cell count was 12,000, 65 per cent polymorphonuclears. Two stool examinations were negative. A Hinton test was negative. The nonprotein nitrogen of the blood was 23 milligrams. A phenolsulphonephthalein test showed 70 per cent excretion of dye in two hours.

X-ray examination of the chest showed several areas of calcification in the right hilus and right lower lung field but the lung fields were otherwise clear. The trachea was in the midline and no mediastinal masses were seen. The heart and diaphragm were negative. A barium enema showed the colon to be negative. A gastrointestinal series showed no abnormality of the esophagus, stomach or duodenum.

On the third hospital day an operation was performed.

### DIFFERENTIAL DIAGNOSIS

DR MARSHALL K BARTLETT The problem here is the differential diagnosis of simultaneous enlargement of the left lobe of the thyroid and adjacent nodes in the neck which run up under the sternomastoid to its cranial attachment. In going over the record there is nothing that particularly helps me. The history of nervousness, diarrhea, emotional instability and palpitation suggests hyperthyroidism. However, only one basal metabolic rate of  $-9$  is given, and evidently those taking care of her were not sufficiently impressed to check it, so I think we will have to discard it. The statement that the size of the mass in the neck changed slightly during the menstrual period is a statement which patients frequently make. It does not mean very much to me and so far as I know is not diagnostic of any particular condition.

In the laboratory work the temperature of  $99^{\circ}$  and the white cell count of 12,000 are the only things that are even slightly abnormal. This perhaps would suggest the presence of a low grade inflammatory process, but that is about as much as I can deduce from them and that certainly is not too definite.

The question in my mind is whether the lump in the thyroid and the glands in the neck are parts of the same process or are two separate processes. Certainly the commonest cause for enlargement of the left lobe of the thyroid in a woman of thirty-nine would be an adenoma, but adenoma would not ordinarily be associated with glands in the neck. On the other hand the commonest cause for chronic enlargement of cervical glands in a woman of her age would be tuberculosis. I should say, however, that that would not account for the lump in the thyroid. Of course it is possible that there are two separate pathologic processes here. But I think it is very dangerous to assume that there are two if we can find something that will account for both of them.

What will account for both of them? Chronic thyroiditis is a possibility. The cases of chronic thyroiditis that I have seen have involved the thyroid more diffusely. The entire gland was involved, and I have not seen the regional nodes involved. I do not believe that that will explain it. An acute inflammatory process may involve one lobe and then subside to a chronic stage, but there is nothing in the history to suggest an acute onset. I do not believe that will do. Tuberculosis involving the thyroid is a possibility. It is very rare, however, and on that basis alone we prefer to exclude it. Actinomycosis is a possibility. It is exceedingly rare. I think we can rule out syphilis on the basis of the negative Hinton. So it seems to me that when we have gone through all the possibilities the diagnosis of adenoma is still the most likely thing to account for the swelling of the thyroid.

As I see it, the only way we can make an adenoma of the thyroid account for the enlargement of the cervical nodes is to assume that it has undergone malignant change and that she has metastases. If it has undergone malignant change, it is probably carcinoma. Lymphoblastoma would be much less common, I should say. Thirty-nine is rather young for carcinoma of the thyroid but of course it is a fairly rare condition anyway, and in that group its occurrence between forty and fifty is not uncommon. I think, considering the whole picture, that the best explanation is adenoma of the thyroid, nontoxic, which has undergone malignant change, and that the glands in the neck are metastatic.

DR TRACY B MALLORY: Are there any other suggestions?

DR HORACE K SOWLES: The x-ray says that there were some areas of calcification in the right hilus and in the left lower lung field. Presumably that was an old tuberculous process there and, if so, perhaps that increases the chance of the glands in the neck being tuber-

culous. I think, however, that Dr Bartlett's assumption that it was fetal adenoma with malignant change is the best bet.

DR AUBREY O HAMPTON: There are small areas of calcification scattered over the base of the right lung and at the right lung root, just like an infantile infection. This is the swelling in the left side of the neck without calcification within it. I see no evidence of tuberculous glands in the neck.

DR SOWLES: Then I think tuberculosis is probably a far cry. These glands were most likely metastatic disease from the thyroid.

DR MALLORY: Dr Hertz, have you anything to add?

DR SAUL HERTZ: Lesions in the lateral aspect of the neck in association with swelling of the thyroid should always make one think of the possibility of aberrant thyroid tissue. A very large percentage of these cases that come to operation show a rather regular recurrence of papillary adenomata, and there is nothing inconsistent with the picture of papillary adenomata in this case.

#### PREOPERATIVE DIAGNOSIS

Carcinoma of the thyroid?

DR MARSHALL K BARTLETT'S DIAGNOSIS

Carcinoma of the thyroid with metastases to the regional lymph nodes

#### PATHOLOGIC DIAGNOSIS

Papillary adenocarcinoma of the thyroid with metastases to the cervical lymph nodes

#### PATHOLOGIC DISCUSSION

DR MALLORY: This case was seen by several medical men at least one of whom thought it was probably lymphoma and wished to have a biopsy of one of the glands. Dr Cope was asked to see it from a surgical point of view and he thought, since his diagnosis was the same as Dr Bartlett's, a primary malignant tumor of the thyroid, that it was unwise to do a biopsy without being prepared to do something more. He made the usual thyroid incision and came down on a considerably enlarged thyroid and a long chain of glands running up to the base of the skull along the internal jugular vein. One of these was excised and showed a typical papillary adenocarcinoma. Following it he resected the left lobe of the thyroid and dissected out the glands as far as he could find any enlargement. He also carried the dissection down a slight way into the mediastinum and removed a portion of the thymus which turned out to be perfectly normal. The thyroid adenoma itself and all the nodes showed a papillary adenocarcinoma. There was one gland just to the other side of the midline which also showed the same picture.

so that I am afraid it is improbable that all the growth was removed. On the other hand this particular kind of papillary tumor in the thyroid is relatively radiosensitive and the patient is now getting postoperative x-ray treatment which should provide a very considerable period of good health before recurrence appears.

DR HORATIO ROGERS: I should say that with metastatic glands extending all the way to the cranial attachment of the sternomastoid the chance of cure if the tumor was malignant was slight anyway, so that perhaps the treatment of taking a biopsy to establish a diagnosis and then treating the whole thing by x-ray

rather than surgery would have been perfectly proper.

DR MALLORY: We were in considerable doubt ourselves as to what the wisest method of treatment was. Of all the various forms of malignant disease in the thyroid this is the lowest form of malignancy that definitely will metastasize, so that I think radical surgery has more point than it would with a frank carcinoma.

DR HERTZ: Follow up cases from the thyroid clinic indicate that radical resection of a tumor plus x-ray treatment has advantages over x-ray treatment after biopsy.

The question in my mind is whether the lump in the thyroid and the glands in the neck are parts of the same process or are two separate processes. Certainly the commonest cause for enlargement of the left lobe of the thyroid in a woman of thirty-nine would be an adenoma, but adenoma would not ordinarily be associated with glands in the neck. On the other hand the commonest cause for chronic enlargement of cervical glands in a woman of her age would be tuberculosis. I should say, however, that that would not account for the lump in the thyroid. Of course it is possible that there are two separate pathologic processes here. But I think it is very dangerous to assume that there are two if we can find something that will account for both of them.

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small granite working establishments. The work was put into operation last May as an approved Emergency Relief Administration project. At the expiration of this agency the project was inactive for three months. On approval by the Works Progress Administration it is again active and now nearing completion.

Of interest in connection with the primitive measures in operation and under investigation is the growing appreciation of the importance of silicosis as an industrial problem, a disease entity and its relation to tuberculosis.

On page 143 of this issue, Dr. John B. Hawes, 2nd, emphasizes the three phases of the subject. This article is worthy of the attention of general practitioners, many of whom have not been made aware of the frequency of this disease or the importance of early diagnosis although much has been written about it.

He makes it perfectly plain that even though silicosis is caused by exposure to certain dusts, the inhalation of the fine particles of organic material does not produce this disease. If the rest of Dr. Hawes' paper is studied and the facts presented kept in mind there will be fewer mistakes in diagnosis in dealing with certain pulmonary disorders.

#### STATEMENTS TO THE PRESS

RECENTLY all the Boston papers have given great publicity to an instance of alleged neglect by the ambulance service of the City of Cambridge. In the earliest reports it was stated that a poor man had called the police department to send an ambulance to take his daughter to the Cambridge City Hospital. Because of departmental rules the ambulance was not sent at once but the night telephone operator got in touch with a doctor who went to see the patient. Immediately after his visit to the patient he sent her to the hospital where she promptly died. The cause of death was stated to be "double pneumonia" and the doctor was alleged to have stated that "*If the ambulance had gone at once the child might have been saved*".

Whether a municipality should be expected to provide immediate ambulance service at the call of any citizen to respond to cases of illness as distinguished from accidents would seem to be a very debatable question. It would not be unreasonable to assume that many more patients might be injured by moving them before they are seen by an experienced doctor than would be injured by a reasonable wait for a physician.

In this instance it is difficult to conceive how transportation to the hospital a few minutes or even hours earlier could have made any difference. It would be of great interest to know

on what grounds the doctor made his alleged statement (if he ever made it).

Such statements stir up a great deal of heat and very seldom accomplish much good. Would it not be a very important, useful and public-spirited service for each local public relations committee of the Massachusetts Medical Society to investigate all such newspaper reports promptly on their own initiative and make a report in the form of a letter to the newspapers and an item in the *Journal*? In some cases constructive suggestions might be made that would do much to raise the standing of the profession beyond its already admittedly high level.

See "A Warning to Physicians" page 170

#### THIS WEEK'S ISSUE

CONTAINS articles by the following named authors

BLAND, EDWARD F. B.S., M.D. University of Virginia Department of Medicine 1927. Assistant in Medicine Massachusetts General Hospital and Harvard University Medical School. Assistant Visiting Physician House of the Good Samaritan Boston. Address Massachusetts General Hospital Boston Mass. Associated with him is

WHITE, JAMES C. A.B. M.D. Harvard University Medical School 1923. F.A.C.S. Assistant Professor of Surgery, Harvard University Medical School. Assistant Visiting Surgeon Massachusetts General Hospital. Address Massachusetts General Hospital Boston, Mass. Their subject is Relief of Severe Angina Pectoris in Young People with Rheumatic Heart Disease. With Remarks on an Atypical Anginal Syndrome. Page 139.

HAWES, JOHN B. 2ND. A.B. M.D. Harvard University Medical School 1903. President, Boston Tuberculosis Association 1922. Secretary, State Tuberculosis Commission 1907-1918. Consultant Diseases of Lungs U.S. Veterans' Bureau, New England District 1918-1926. Director, National Tuberculosis Association and Massachusetts Tuberculosis League. His subject is Silicosis. Page 143. Address 330 Dartmouth Street, Boston Mass.

TILLOTSON, KENNETH J. M.Sc., M.D. University of Vermont College of Medicine 1921. Psychiatrist-in-Chief McLean Hospital, Waverley. Psychiatrist Massachusetts General Hospital. Assistant Psychiatrist in the Department of Hygiene Harvard University. Instructor in Psychiatry Harvard University Medical School. His subject is Psychobiology in General Medicine. Page 146. Address McLean Hospital, Waverley Mass.



# The New England Journal of Medicine

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## HEREDITY AND SPONTANEOUS CANCER

BIOLOGIC experimentation has been conducted for many years in an attempt to determine the rôle of heredity in susceptibility or resistance of animals to cancer. In a recent article, Little<sup>1</sup> has criticized the majority of this work on the grounds that homogenous or highly inbred strains were not used and, hence, that the genetic variables that were present vitiated the conclusions. Such homogenous strains of mice have been developed—some with a relatively high and others with a low incidence of spontaneous cancer of the breast. Experiments conducted with these strains have been reported and Little believes that certain conclusions are warranted.

It has been established that the incidence of spontaneous breast cancer in the first and second hybrid generations is largely dependent on the ancestral strain, but, as high incidence follows the maternal line, this type of inheritance is nonmendelian. The genetic factors involved in the incidence of lymphosarcoma are equally derived from the male and female line, a char-

acteristic of mendelian inheritance. Blockage of the nipples (irritation) results in an increased incidence in high cancer stock, but has no effect in low cancer stock. Virginity and the absence of ovarian secretion (castration) retard breast development and, hence, reduce cancer incidence. Transplantation of ovaries of either high or low cancer stock into castrated females restores the normal incidence of breast cancer. By keeping the genetic factors constant and by varying the ovarian and mammary factors and vice versa, it has been shown that both the internal environment of the individual and the hereditary transmission of constitutional influences have a definite effect on the incidence of breast cancer.

Though accurate biologic experiments of this sort tend to render ineffectual any attempt to draw conclusions from statistics of human families, they do offer one reasonable approach to the study in the laboratory of the nature and cause of cancer.

## REFERENCE

1. Little, C. C. The Present Status of Our Knowledge of Heredity and Cancer. J. A. M. A. 106:2234 (June 27) 1935.

## SILICOSIS AND TUBERCULOSIS

GRANITE dusts are still uncontrolled in most small granite cutting plants. Representatives of the Massachusetts Tuberculosis League, New Hampshire Tuberculosis Association and Vermont Tuberculosis Association, led by Dr. Frederick T. Lord, President of the League, and Mr. Manfred Bowditch, Director of the newly created Division of Occupational Hygiene of the State Department of Labor and Industries, paid a visit to the granite dust control demonstration at Quincy, Massachusetts. This research concerns control of granite dust in small granite works.

Aside from much experimentation with the devices of inventors the demonstration's chief value may be a study and grading of granite dust control devices now on the market. This data will presently be compiled by the Division of Occupational Hygiene and so made available to all concerned.

The above mentioned agencies have assisted with the financing of this experiment as have the City of Quincy, Metropolitan Life Insurance Company, National Tuberculosis Association, Granite Cutters International Association of America, Liberty Mutual Insurance Company, American Mutual Liability Insurance Company, Employers' Liability Assurance Corporation, Ltd. and the United States Mutual Liability Insurance Company. It was done because while larger companies can afford dust control systems and may know which are efficient, these things were generally untrue of

of unethical conduct which in its judgment are of greater than local concern. Such investigating juries, if probable cause for action be shown shall report with formal charges to the President who shall appoint a Prosecutor who in the name and on behalf of the American Medical Association, shall prosecute the charges against the accused before the Judicial Council. The Council shall have the power to acquit, admonish suspend or expel the accused. The language and purpose of the action are clear. Organized medicine can fix ethical standards and insist upon their observance by all its members.

Most physicians are guided by high ethical principles. To one who is responsive to the best traditions of medicine and to the nobility of character and sincerity of purpose which have created its ideals the reflection of unethical conduct upon the profession is humiliating and intolerably offensive.

#### COMMITTEE ON LEGISLATIVE ACTIVITIES

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By—R. L. SENSENICH

203 J. M. S. Building  
South Bend, Indiana  
June 20, 1936

#### RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR MAY, 1936

Disease	May 1936	May 1935	5 Yr Aver age*
Anterior Poliomyelitis	16	3	3
Chickenpox	877	1129	1058
Diphtheria	26	38	91
Dog Bite	1237	1316	706
Epidemic Cerebrospinal Meningitis	27	10	7
German Measles	1043	9786	2149
Gonorrhea	441	524	519
Lobar Pneumonia	423	428	350
Measles	6104	1751	3003
Mumps	1889	674	812
Scarlet Fever	924	980	1402
Syphilis	446	399	378
Tuberculosis Pulmonary	352	334	346
Tuberculosis Other Forms	36	49	50
Typhoid Fever	9	15	13
Undulant Fever	4	3	2
Whooping Cough	331	504	794

Based on the figures for the preceding five years

#### RARE DISEASES

*Anterior poliomyelitis* was reported from Adams 1 Chelsea 1 Colrain, 1 Greenfield 1 Southboro 10 Winthrop 1 Worcester 1 total 16

*Diphtheria* was reported from Boston 8 Cambridge 1 Chelsea 2 Fall River 2 Lowell 3 Ran-

dolph 1 Revere 3 Shirley 1 Somerville 1 Tewksbury State Infirmary 1 Westford 1 Worcester 2 total 26

*Dysentery bacillary* was reported from Attleboro 2 New Bedford, 1 total 3

*Epidemic cerebrospinal meningitis* was reported from Belmont 1 Boston 13 Brockton 1 Cambridge 1 Chelsea 1 Hull, 1 Leominster 1 Lynn, 1 Marblehead, 1 Medfield 1 Quincy 1 Somerville 1 Stoneham 1 Westfield 1 Winthrop 1 total 27

*Malaria* was reported from Boston 1

*Septic sore throat* was reported from Amesbury 1 Beverly, 1 Boston 4 Cambridge 2 Fall River 1 Gardner 5 New Bedford, 1 Watertown 1 Worcester 1 total, 17

*Trachoma* was reported from Cambridge, 1

*Typhoid fever* was reported from Boston 2 Cambridge 1 Lawrence 1 New Bedford, 1 Norwood 1 West Springfield 1 Winchester, 1 Worcester 1 total 9

*Undulant fever* was reported from North Adams, 1 Northampton 1 Whitman (1935 case), 1 Wrentham 1 total 4

The reporting of anterior poliomyelitis to date in the State as a whole shows nothing unusual.

Epidemic cerebrospinal meningitis had its highest reported May incidence since 1919.

Diphtheria with its lowest reported May morbidity is running somewhat below the record low figure of 1935.

The reported incidence of typhoid fever to date is 24 per cent lower than in 1935.

Pulmonary tuberculosis cases and deaths are being reported somewhat below last year's figures.

The reporting of mumps reached its highest May figure while that of whooping cough was lower than for any May of which there is record.

Measles reached its highest May incidence since 1930.

The reported incidence of German measles although higher than usual for May was below 1935.

The reporting of chickenpox, lobar pneumonia and tuberculosis other forms showed nothing remarkable.

#### RESOLUTIONS UNANIMOUSLY ADOPTED BY THE AMERICAN MEMBERS OF THE INTERNATIONAL SOCIETY OF SURGERY\*

This meeting was held at the call of the American National Committee of the International Society consisting of Drs. Elliott Cutler, Boston Chairman, Eugene Pool, New York and Rudolph Matas, New Orleans (President of the International Society of Surgery) who submitted the resolutions as follows:

Since it has come to the notice of the American Committee of the International Society of Surgery and of the Fellows of the International Society in the United States that a movement is on foot to es-

\*At a meeting held with the annual session of the American Surgical Association at Chicago on Friday, May 5, 1936.

ROBINSON J MAURICE AB, MD University of California Medical School 1930 Resident Radiologist Massachusetts General Hospital Formerly, Assistant in Medicine, University of California Medical School Address Massachusetts General Hospital, Boston, Mass Associated with him is

SPENCER, JACK MD University of Virginia Department of Medicine 1931 Roentgenologist, Palmer Memorial Hospital Assistant Roentgenologist, Collis P Huntington Memorial Hospital Research Fellow in Medicine, Harvard University Medical School Address 695 Huntington Avenue, Boston, Mass Their subject is Roentgen Therapy of Acute Postoperative Parotitis Page 150

DAYTON, NEIL A MD Ohio State University College of Homeopathic Medicine 1915 Director of Statistics and Research, Massachusetts State Department of Mental Diseases, Boston, Mass Instructor in Psychiatry, Tufts College Medical School His subject is Marriage and Mental Disease Page 153 Address State House, Room 167, Boston, Mass

## MISCELLANY

### A WARNING TO PHYSICIANS

There is said to be on his way to Massachusetts a young man twenty two to twenty four years of age five feet ten inches tall, weight 150 lbs dark brown hair This individual consults physicians for fictitious ailments usually sore throat and cold on the chest etc He pays for the examination with a twenty dollar note which will be found to be counterfeit He is said to be American with pleasing personality and acts in a manner to imply that he is a resident of the district in which the doctor resides

Any information should be transmitted immediately to the United States Secret Service, Boston Massachusetts telephone Liberty 5600, attention of Agent McDermott

### TO PRESIDENTS AND SECRETARIES OF STATE ASSOCIATIONS AND DELEGATES TO THE AMERICAN MEDICAL ASSOCIATION

#### LAYMEN LOOK TO MEDICAL ORGANIZATION TO CORRECT UNETHICAL PRACTICES

A public official, in conference upon a matter of medical economics recently held that the plan of medical organization was weak in that the standards of ethics in county societies vary with the level required by the membership of each local unit This he added cannot readily be corrected so long as the local members are indifferent to or approve of unethical practices He suggested that if medical organization cannot or will not correct this defect and apply its efforts to the maintenance of desirable standards it might better place itself under

the supervision of The Better Business Bureau Chamber of Commerce or some similar group

Excessive charges for medical services rendered to those of meager income is the most troublesome and inexcusable example of unfair economic practice It is admitted that patients may be at fault in not making their financial conditions known, and the average fee may be obviously excessive for a patient of very limited finances Some physicians endeavor to justify excessive fees charged those of very low income on the basis of charity service rendered others It is plain that this position is not tenable Moreover investigation generally reveals that charity does not flow in any greater proportion from the hands of those who most often use this excuse for unjustifiable overcharge The use of unfair collection methods for the exaction of fees known to be excessive must be recognized as a 'racket' Laymen have questioned the disproportionate number of surgical procedures and amount of service rendered by certain physicians to those on medical relief Thoughtless physicians seem to assume that transactions between the physician and his patient are governed only by 'laissez faire' On the contrary the physician, in the system of graduated fees accepts responsibility to the profession, to treat with fairness the individual who is admittedly unable to judge his needs for service or fix the compensation therefor

That which makes the individual ethical and fair without conscious deliberation, lives in the fibre of that individual and viewed from a moral, intellectual or spiritual approach, is to some degree an unteachable quality The interests of the whole group and of the public as well as those of the individual, make it necessary that certain ethical standards be set up rules of behavior defined and certain stringencies of group requirements imposed These can be taught and should assist the individual to that form of self-discovery by which he may see himself in his relation to fellow members of his profession and the public which he serves The Principles of Medical Ethics contain definite economic implications as pointed out by the Bureau of Medical Economics in Economics and the Ethics of Medicine

The conduct of the individual in the economics of medicine is rightfully of interest to fellow physicians The attitude of county medical societies toward unethical conduct and unfair economic practice is a matter of interest to other Component Societies to the State Association and to the American Medical Association The responsibility of each is clear In the politico social organization of government the acts of individuals or small groups may unfavorably affect national attitudes

The attention of the membership of component societies should be directed to the amendment to the By Laws of the Association, which extends the power of the Judicial Council in matters of fellowship and medical ethics so that it shall have authority to request the President to appoint investigating juries to which it may refer complaints or evidence

## CORRESPONDENCE

### ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

535 North Dearborn Street, Chicago, Ill.,  
June 30 1936

Managing Editor,  
*The New England Journal of Medicine*

In addition to the articles enumerated in our letter of May 29 the following have been accepted

Campbell Products, Inc  
Kephrine  
Kephrine Hydrochloride  
Kephrine Hydrochloride Bandages  
Kephrine Hydrochloride Gauze  
Kephrine Hydrochloride Powder  
Kephrine Hydrochloride Rectal Suppositories

Lederle Laboratories  
Allergenic Extracts—Lederle

Sharp & Dohme, Inc.  
Diphtheria Toxin for Schick Test Diluted Ready for Use—Mulford  
Diphtheria Toxin for Schick Test Control Diluted Ready for Use—Mulford  
Insulin—Mulford 100 units 10 cc

The following articles have been accepted for inclusion in the List of Articles and Brands Accepted by the Council But Not Described in N.N.R. (New and Nonofficial Remedies 1935, p 445)

Lederle Laboratories Inc  
Glycerinated Allergenic Extracts—Lederle  
Truesdall Laboratories, Inc  
Golden State Agar Agar

Yours sincerely

PAUL NICHOLAS LEECH *Secretary*,  
Council on Pharmacy and Chemistry

## REPORTS OF MEETINGS

### PETER BENT BRIGHAM HOSPITAL LECTURE

The last lecture in his series was given on May 25 1936 by Dr K H. Giertz, Surgeon in Chief pro tempore in the Peter Bent Brigham Hospital on the subject of 'The Development of Respiratory Apparatus in Thoracic Surgery'

Until the beginning of the present century surgery on the chest was limited to operations for empyema and abscess of the lung and rarely for repair of trauma to heart or lungs. In spite of the tremendous progress made in thoracic surgery in recent years, operations within the pleural cavity are not yet performed with the safety to be expected in other surgical procedures. One of the most notable accomplishments has been the successful approach to the problem of maintaining the respiratory function of the lungs in as nearly a physiological manner as possible while the pleural cavity is open.

The ventilating efficiency of the lung depends on an alternating contraction and expansion driving the air in and out. The mediastinal wall, a thin flexible structure shared by both pleural cavities, yields readily to differences of pressure between the two sides. When both pleural cavities are open to atmospheric pressure the lungs collapse from their own elasticity and cause a rapid death from asphyxia. One pleural cavity opened widely is almost as serious, for the mobile mediastinum is shifted to the sound side on inspiration and away from it on expiration so that most of the increased pleural space gained in inspiration is lost by this flutter of the mediastinum, producing asphyxia. Adhesions involving the mediastinum tend to decrease this flutter. The smaller the hole in the chest wall the less is the amount of air which moves in and out each time and the less the degree of asphyxia. Since the dangers from operative pneumothorax are so very great, the ability to prevent an asphyxial death from mechanical interference with ventilation is a prime requisite for successful thoracic surgery.

Animal experiments give complete confidence in the physiological sufficiency of respiration achieved by mechanically forcing air in and out of the lungs. Artificial respiration by air under pressure is a very old procedure which for a time was held in disfavor because it was believed to produce acute pulmonary emphysema with the rupture of alveoli and laceration of the lungs. Not until 1897 did the surgeons begin to revive the practice of insufflation for their uses. In that year the Fell O'Dwyer apparatus was in use in the Presbyterian Hospital in New York and shortly thereafter Matas used a modification of it in New Orleans.

In Germany a different approach was made through the study of differential pressure chambers for the body and head. At first it was believed that a chamber for the body containing air at a pressure lower than atmospheric gave results superior to a head chamber or airtight mask providing air at an increased pressure, but the work of Giertz from 1914 to 1916 demonstrated that either method gave physiologically equal results and that the convenience and dependability of the apparatus available should decide the choice. The use of air under differential pressure removes the immediate symptoms of pneumothorax, such as cyanosis but since the movements of the lung are still dependent on the movements of the bony thorax, it is impossible to secure pulmonary ventilation if the thorax is opened widely. Under this system the respiratory expansions are much reduced at best and extraordinary care is required in doing a unilateral pleurotomy not to open the sound side especially if there are no adhesions. The chief disadvantages of the differential pressure method are that the respiratory rate is slowed that the thorax breathes in the inspiratory position with the diaphragm low, and that the mediastinum is only relatively fixed. The treatment for the signs of respiratory distress consists in closing the chest giving oxygen inhalation, and using rhythmical mechanical aids to respiration. The

establish a new International organization, with headquarters at Geneva (Switzerland) which has for its alleged purpose the promotion and cultivation of the science of Surgery by the joint co-operation of the leading surgeons of the world, in the interests of common humanity and

Whereas, the identical purpose in its essential principles has been fulfilled for the last thirty two years by the International Society of Surgery, a thoroughly representative world organization, exclusively devoted to the promotion and advancement of Surgery in all its cooperative international relations and

Whereas, It has been reliably reported that this newly constituted organization has been represented as connected and supported by the Rockefeller Foundation, of New York, and

Whereas, on direct inquiry the Rockefeller Foundation denied any knowledge of or relationship to the so-called International College at Geneva and

Whereas, this new enterprise is seemingly managed and controlled by a small group of self constituted founders and promoters at Geneva, and

Whereas, this new enterprise has not originated in response to any known appeal or expressed need from any of the constituted or representative surgical societies of Europe or America,

#### Be It Hereby Resolved

That the American Fellows of the International Society, who constitute one of the largest units of that organization and who are here in large representative attendance at the annual meeting of the American Surgical Association, do now, and, in meeting assembled, emphatically protest against the creation of a new and self constituted international organization or project that is calculated to injure the most vital interests of the International Society, to which they belong and owe allegiance and in furtherance of this protest all the Fellows of the International Society in the United States are urged to withhold their endorsement support or alignment with the so-called International College of Surgeons at Geneva, or its ramifications in the United States

Until the true status and motives that underlie this new and self constituted enterprise are fully determined in their relations and effect upon the welfare of the International Society, by the investigations of the American Committee under the Chairmanship of Dr Cutler'

The conclusions of this committee are to appear in due time in the *International Journal of Surgery* the official organ of the International Society, published at Brussels

#### SUPPLEMENTARY NOTE

Since the meeting at Chicago the American Committee, including the President of the International Society, have seen no reason to change their views or the text of the resolutions unanimously adopted at that meeting. On the contrary they are now more than ever confirmed in their belief that the

self constituted International College of Surgeons with alleged headquarters in Geneva and New York, has no justification for its existence and, much less for its high flimsy pretensions

**EDITOR'S NOTE** The resolutions noted above are of particular interest in view of the article, 'The International College of Surgeons — Why?' which recently appeared in the *Journal of the American Medical Association* (June 20, 1936) under the heading of current comment

#### RESOLUTION ADOPTED BY THE JOINT COMMITTEE ON HEALTH PROBLEMS IN EDUCATION OF THE NATIONAL EDUCATION ASSOCIATION AND THE AMERICAN MEDICAL ASSOCIATION

JUNE, 1936

Moved by Dr Bauer seconded by Dr Leland

Whereas At the annual meeting of the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association held at St Louis Mo, February 25 1936, a presentation was made by Major Joel I Connolly, of the Chicago Board of Health relating to possible health hazards in apparently modern plumbing installations in public buildings and

Whereas, It was manifest in the said presentation that plumbing fixtures which have been generally regarded as safe and sanitary in design may in fact constitute a real and serious health hazard by reason of the danger of back siphonage and contamination of water supply mains and

Whereas The probability exists that such apparently modern safe and sanitary plumbing installations may exist in numerous school buildings in the United States and

Whereas, The existence of such apparently safe, modern and sanitary plumbing installations and reliance upon them brings about a sense of false security therefore, be it

Resolved By the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association that this Committee apprehends the possibility of danger to the health of school children from apparently safe, modern and sanitary plumbing installations in school buildings, and be it further

Resolved That the said Joint Committee earnestly recommends to all school boards and school executives that surveys be instituted by competent engineers to ascertain whether or not the danger of back siphonage and consequent pollution of water supply mains exist in plumbing installations within their jurisdictions and that such surveys be followed by prompt corrective measures, and be it further

Resolved That these resolutions be offered for publication to all journals dealing with public health health education and general education

whether this term should be applied to a high diaphragm unless diaphragmatic paralysis was also existent. Dr Henry Christian commented upon the frequency of anemia of blood loss in patients with diaphragmatic herniae and eventration. He suggested that the vital capacity might contribute to her feeling of weakness because of the lack of proper ventilation.

Dr J H Marks remarked that diaphragmatic elevation on the right produced few symptoms but that a similar elevation on the left caused dyspnea and weakness. Operations on such cases are of little value if there is paralysis of the diaphragm, since there is muscular atrophy and the bowels push the weakened organ. In this case Dr Marks felt that a plastic operation might be beneficial.

The surgical case was presented by Dr R L Peterson. A sixteen year old Italian boy began to experience pain in the left lower jaw five months previously and was referred to a hospital by his dentist. There he was given x-ray treatments and medicines. Six weeks before entry to the Peter Bent Brigham Hospital a mass was excised from the left lower jaw and x-ray treatments were given. In spite of these measures the pain became so severe and there was such a foul taste in his mouth that he could not eat. He lost twenty two pounds during the past four months. The family and past histories were negative. Physical examination on entry was negative except for a large, firm, painful mass involving the left lower jaw and extending into the buccal cavity. There was no enlargement of the lymph nodes in the neck. X-ray examination showed involvement of the entire left mandible by a rarefying destructive process with spicules of bone radiating perpendicularly to the axis of the bone. The diagnosis of primary osteogenic sarcoma was made.

Dr Sosman stated that radiation therapy was of little value in the treatment of osteogenic sarcoma. Dr Wolbach remarked that the mandible was an extremely rare location for such tumors. Dr C C Simmons had seen the patient in consultation and had advised radical hemisection of the jaw. No decision had as yet been made as to what form of therapy would be employed.

Dr S Burt Wolbach, Shattuck Professor of Pathology at the Harvard Medical School, presented the paper of the evening speaking on 'The Pathology of Vitamin Deficiencies'. Dr Wolbach regards each vitamin as being responsible for a particular chemical process in the body. If the body is deprived of a vitamin some vital process or processes are suspended. Each vitamin deficiency is a specific starvation in which there is a primary break in some metabolic process. It is impossible to starve one part of the body without affecting the rest of the organism as a whole. Therefore there are secondary effects of vitamin deficiency as for example the anemia often seen in scurvy.

The bodily reactions to deficiencies of the various vitamins were discussed in detail. Vitamin E or

the 'antisteilitv' vitamin, has recently been isolated in pure form. In rats its absence from the diet renders the rat sterile, causing testicular atrophy in the male and preventing the development of the fetus in the female after implantation of the fertilized ovum.

The vitamin B complex is now known to be divisible into at least four different substances each of which has some specific rôle in the maintenance of normal bodily function. The heat labile fraction is known as vitamin B<sub>1</sub> and is concerned with the metabolism of the axones and nerve cells of the ganglia, the spinal cord and the brain. Deficiency of this substance causes polyneuritis or beriberi, but the mechanism of the pathogenesis of this disease is not understood. Pathologically it is characterized by a myelin sheath degeneration, and by definite changes in the Nissl granulations of the nerve cells. Restoration of the vitamin causes very rapid amelioration of symptoms. The heat stable fraction of the vitamin B complex has three components each of which has a slightly different action in the animal body. Some fractions will prevent rat pellagra without affecting human pellagra, and vice versa. Pathologically pellagra is characterized by an engorgement of vessels, and an increased rate of growth of the epidermis with an increase in keratinization. There is also a myelin sheath degeneration which is not relieved by administration of vitamin B<sub>1</sub>.

Keratomalacia is a specific starvation of epithelial structures for vitamin A. Secretory epithelium undergoes a marked atrophy as a result of withdrawal of this substance and becomes physiologically non-viable with a complete suppression of secretion. The cells of the various body surfaces lose their efficiency as covering epithelium which excites repair in the basal layers with marked proliferation. An 'undermining' process occurs with replacement of the normal squamous cells. There is a continuous desquamation of keratinized cells which gives rise to the gross pathology of the disease. Accumulations of these desquamated cells may resemble abscesses. Great thickening of the epithelium of the cornea and the desquamation of keratinized cells irritating to the eye take place and there is vascularization of the substantia propria. There is atrophy of the enamel forming organ and inclusions of cells of this organ are found in the thin dentine of the labial side of the tooth and in the pulp cavity. The capillaries in the region of the enamel forming organ show a selective permeability to calcium and therefore calcareous concretions are formed.

Vitamin A deficiency in an immature rat causes a change in the epiphyseal line which becomes similar to that of an adult animal. Restoration of the vitamin causes an awakening of the cartilage cells and a new growth of bone.

If the vitamin is supplied after deficiency there is immediate regeneration of the epithelial tissues. The keratinized material undergoes vacuolization and there is leucocytic infiltration. The basal cells mul-

minor circulation suffers under differential pressure by compression of the small vessels in the lung which produces impaired lung circulation and an interference with the diastolic filling of the heart.

An interrupted air current introduced by intra tracheal insufflation overcomes many of these difficulties and makes breathing more nearly normal. For satisfactory function one must have a properly located intratracheal tube closing the trachea efficiently and admitting under suitable pressure air saturated with water vapor. The tube is introduced by direct tracheoscopy which is easily done by an expert. A distensible rubber bladder near the end of the tube is inflated to make an airtight fit, after two hours use only a slight hoarseness is noticed. The chief advantage is that adequate ventilation is secured when the thoracic cavity is opened widely, and that no air is introduced into the stomach.

An inhalation apparatus developed in Sweden the 'spiropulsator', with a series of valves regulating the flow of gas in and out enables the operator to adjust the pressure to suit the individual to control the lengths of inspiration and expiration and to measure exactly the volume of gas injected. The prompt uninterrupted exit of gas assured by this machine is very important.

Since the clinical success of the apparatus depends on the patient not straining or coughing profound narcosis or complete local desensitization must be achieved before the tube is inserted. Nitrous oxide is acceptable as a nonirritating anesthetic and because the spiropulsator permits the use of a low oxygen tension, sufficient of the gas to produce adequate narcosis can be given.

Morphine, atropine, and codeine are given preoperatively, and 2 per cent cocaine applied locally in the trachea and bronchi. If secretion or aspiration of infected material from the diseased part of the lung is feared, it is walled off by a gauze pack containing some local anesthetic. A mixture of 75 per cent oxygen and 25 per cent nitrous oxide is insufflated at a rate of twenty five to thirty five times a minute each injection consisting of 500-600 cc of gas warmed to 30° C and saturated with water vapor. If the narcosis is not deep enough evipal or a little ether may be given for it is essential to have a complete suppression of reflexes particularly those arising near the hilus of the lung.

The operation of lobectomy or pneumonectomy is performed through a posterior thoracic incision after resection of the fifth, sixth and seventh ribs. Extensive adhesions are dissected with the diathermy knife and bleeding points touched with diathermy. The pleura is drained through a catheter ending under water outside. Closing the bronchial stump is quite a problem which has been solved by covering it over with fascia lata and burying it under the pleura in the mediastinum or by invaginating the end, a difficult feat because of the stiff cartilage.

Before operation is undertaken diagnosis must be made as accurately as possible by all available methods the most useful of which are x-ray and bronchoscopy, with a biopsy if necessary.

Dr. Glertz concluded by expressing his appreciation of American advances in the technique of thoracic surgery.

Dr. Elliott C. Cutler closed the meeting after paying tribute to Dr. Glertz as an investigator and teacher of whom the Swedish people may justly feel proud.

#### HARVARD MEDICAL SOCIETY

The Harvard Medical Society met at the Peter Bent Brigham Hospital on April 28, 1936, with Dr. Merrill C. Sosman presiding.

The medical case was presented by Dr. William Clauser. A thirty six year old Negress entered the hospital complaining of a feeling of fatigue throughout her adult life. She was first seen twenty two years ago when she complained of fatigue, lassitude, and back pain. No diagnosis was made at that time. Three years ago she was seen in the outpatient department because of menorrhagia and weight loss of ten pounds. Physical examination at that time was reported negative except for the fact that the right border dullness of the heart was found to be seven centimeters to the right of the midsternal line and the left border dullness five centimeters to the left of this line. The Aschheim Zondek test was positive. The red count was 4,500,000 and the hemoglobin 75 per cent. An x-ray of the chest revealed an elevation of the left diaphragm.

Eight months before the present admission she began to experience the periodical occurrence of burning pain in the precordial area which occasionally radiated to the left shoulder or to the right side of the chest. This pain often occurred while she was resting and was not relieved or accentuated by lying down. Six weeks ago she was seen in the outpatient department, complaining of severe dyspnea, and precordial pain.

Physical examination on entry was essentially negative except for emaciation and the findings in the chest. Inspection of the chest revealed unequal excursion of the right and left sides and a cardiac pulsation to the right of the sternum. The right chest was resonant to percussion but the left was tympanitic below the third rib anteriorly and there was a band of dullness 5 cm wide at the level of the seventh rib posteriorly which moved with respiration. Breath sounds were absent in the left chest below the level of the seventh rib and borborygmi were audible in this area. The vital capacity was 2400 cc. Fluoroscopic examination showed the left diaphragm to be at the level of the fifth rib on inspiration and at the second on expiration. There was no paralysis of the left diaphragm since it did not move paradoxically. The heart and trachea moved laterally on inspiration and expiration. The electrocardiogram showed no shift of axis during respiration, however in spite of these motions.

The case was diagnosed as eventration of the diaphragm although Dr. Sosman raised the question



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## ALLERGY TO AMIDOPYRINE BLOOD STUDIES FOLLOWING ANAPHYLACTIC-LIKE SHOCK IN A PATIENT\*

BY MAURICE B. STRAUSS, M.D.†

**A**GRANULOCYTOSIS was causally associated with the administration of amidopyrine (aminopyrine, U S P XI) by De Vries,<sup>1</sup> Madison and Squier,<sup>2</sup> and Watkins<sup>3</sup> in 1933. At the present time there seems to be but little doubt that certain cases of agranulocytosis result from the administration of this and related drugs.<sup>4</sup> It is equally true that many patients develop this condition without having taken any drugs whatsoever.<sup>5</sup>

Hunter<sup>4</sup> has listed fifty-three drugs, many of them dispensed directly to the laity, which contain amidopyrine. In view of the wide spread use of these compounds and of amidopyrine as such, the rarity of agranulocytosis makes the conclusion inescapable that either very large doses must be ingested or that there must be some idiosyncrasy on the part of the individuals who develop agranulocytosis following the ingestion of one or more of these drugs. The studies of various investigators have shown that excessive or even large doses are not necessary to produce agranulocytosis, and hence the conclusion that individual idiosyncrasy must be present appears sound. Most observers have labeled this untoward reaction "allergy" or "hypersensitivity."

Taussig<sup>6</sup> has reported his own case which was somewhat similar to the one reported here. Urticaria, angioneurotic edema of the lips, and bronchial asthma followed the ingestion of 0.3 gm of amidopyrine on two occasions. Examination of the blood shortly after one attack and on three occasions during the next four days showed the leucocytes to vary between 5,100 and 8,300 per cubic millimeter with the granular cells from 49 to 56 per cent of the total number. Unger<sup>7</sup> noted the occurrence of urticaria and angioneurotic edema the day following the ingestion of three allonal tablets (which contain amidopyrine), and later after 0.3 gm of amidopyrine. Hansen<sup>8</sup> observed a woman who developed chills, pruritus and a skin rash five hours after ingesting a tablet of an amidopyrine containing drug. Crohn<sup>9</sup> observed urticaria

and angioneurotic edema following the ingestion of amidopyrine. Lihenstein,<sup>10</sup> Haas,<sup>11</sup> Fechner,<sup>12</sup> and Meredith<sup>13</sup> have reported similar phenomena from the ingestion of combinations of a barbiturate and amidopyrine, but not from amidopyrine alone. No blood studies are reported for any of the cases mentioned above except Taussig's.

### CASE REPORT

E. R. B., a married white woman thirty-six years old, had always enjoyed good health. The family history revealed nothing relevant on the paternal side. Her maternal grandmother had had diabetes. Two maternal aunts had heart disease. One maternal aunt suffered from urticaria following exposure to cold and a maternal uncle had "rose fever." The patient's mother had hypertension.

The patient had measles, pertussis, varicella, and jaundice in childhood. A perforated appendix was removed at the age of ten years. Tonsillectomy was performed at the age of twenty-two for repeated attacks of tonsillitis. The patient had been married for eleven years. Her husband and a son aged nine years were both in good health.

At about the age of sixteen the patient commenced taking amidopyrine for headaches. At this time she had frequent attacks of urticaria. In her twenty-first year she awoke one night with a severe headache, arose, and took ten grains (0.6 gm) of amidopyrine. Within a few minutes she suffered from urticaria, lost consciousness, became incontinent of urine and feces and vomited. Two years later a similar attack occurred after the patient had drunk some water from a glass. It appeared that about one hour earlier a member of her family dissolved some amidopyrine powder in water in this glass following which it had been rinsed. At the age of twenty-nine a severe attack was brought on by the ingestion of a tablet of allonal (containing amidopyrine). Two further incidents indicate the extreme degree of hypersensitivity exhibited by this woman. One evening at a friend's house, she lighted a cigarette, took one puff and developed swelling and itching of the lips. On careful questioning it was recalled that the cigarette box had been purchased three months before and at that time the owners of it had kept a single tablet of amidopyrine in the box overnight. Similar symptoms developed when the patient chewed a stick of chewing gum which wrapped in tin foil and paper had been in a purse that previously had harbored several amidopyrine tablets. The patient also knew that on one occasion her fingers became swollen from taking an amidopyrine tablet out of a vial in order to hand it to her mother.

In August 1934 skin tests were performed as follows. A paste was made of approximately twenty-five mg of amidopyrine in 0.5 cc of water. This was

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tively in normal fashion, and there is restoration of the epithelial characteristics of the specific area. It is interesting to note that the metaplasia and vacuolar degeneration of repair in vitamin deficiency is the same process histologically which normally occurs in the genital tract of rodents during each estrus cycle.

Dietary deficiency of vitamin D produces the formerly common disease rickets. In this condition there is a disturbance in the normal growth processes in the epiphyseal cartilages. Normally there is a proliferation of the cartilage cells on the epiphyseal side of the "growth line," and a degeneration of the older cartilage cells on the diaphyseal side of the line. Blood vessels grow into the areas formerly occupied by these cells and there is an accompanying ingrowth of osteoblastic cells which lay down osteoid tissue. After the degeneration of the cartilage cells there is a calcification of the cartilaginous and osteoid matrices. In rickets there is an acceleration of cartilage growth, and the cartilage cells remain viable preventing the ingrowth of blood vessels into the diaphyseal side of the epiphyseal line. There is no calcification of the cartilaginous matrix, and no osteoid matrix is laid down. As a result there is an irregular widening of the epiphyseal line. Restoration of vitamin D causes a resumption of the normal growth sequence within twenty-four hours; there is degeneration of the cartilage cells on the diaphyseal side of the epiphysis, an ingrowth of blood vessels and calcification of the osteoid tissue already present.

Vitamin C deficiency (scurvy) causes a suppression in the formation and maintenance of intercellular substances. Although the fibroblasts, osteoblasts, and odontoblasts are active they produce a fluid substance which is inadequate and which does not solidify. As a result there is no deposition of collagen, osteoid or dentine. Studies of wound healing in scorbutic animals have demonstrated that collagen does not form from predeposited fibrin. In such animals a wound is filled with blood clot in which there is abundant fibrin but no collagen is laid down until ascorbic acid is supplied. Then fibroblastic cells can be found laying down collagen, which can be found only in close proximity to such cells.

In summary Dr. Wolbach stated that vitamin A was concerned with the maintenance of the normal structure of the epithelial tissues, that vitamin C was necessary for the production and sustenance of intercellular substances, and that vitamin D was essential for normal calcification of osteoid and cartilaginous matrices and for the normal sequence of bone growth.

Dr. O. A. Bessey commented briefly on some chemical aspects of the rôle played by vitamin B in the body and stated that choline might be considered as one of the vitamins since it has been found to be one of the dietary essentials. It is necessary for the normal metabolism of fat.

## SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

### CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, JULY 27, 1936

Saturday August 1—

\*10 a. m. - 12 m. Staff Rounds at the Peter Bent Brigham Hospital. Conducted by Dr. Reginald Fitz.

\*Open to the medical profession

August 24-29—Harvard University Tercentenary Celebration. See page 1166 issue of June 4.

September, 1936—First International Congress of Sanatoria and Private Nursing Homes. See page 803 issue of April 16.

September 7-10—International Union against Tuberculosis. See page 664 issue of March 12.

September 7-11—American Congress of Physical Therapy will meet at the Waldorf-Astoria, New York City. See page 62 issue of July 2.

September 14 and 15—Tercentenary Session of the Harvard Medical School. See page 1166 issue of June 4.

October 12-18—Third International Congress on Malaria. See page 1076 issue of May 21.

October 19-23—Clinical Congress of the American College of Surgeons. See page 180 issue of January 23.

October 19-31—1936 Graduate Fortnight of the New York Academy of Medicine. See page 1221 issue of June 11.

October 20-22—Academy of Physical Medicine Annual Meeting. Hotel Statler, Boston.

October 20-23—The American Public Health Association. See page 1226 issue of June 11.

March 30, April 2, 1937—First International Conference on Fever Therapy. Postponement notice. See page 52 issue of July 2.

April 21-24, 1937—American Society for Experimental Pathology. See page 1075 issue of May 21.

## BOOK REVIEW

Cardiac Output and Arterial Hypertension. Sidney A. Gladstone. 56 pp. \$1.00.

This small volume of four chapters represents a partial report of the author's work as the Richard and Ella Hunt Sutro Fellow in Cardiovascular Research at the Mount Sinai Hospital in New York City.

The first two chapters deal with critical investigations of certain details in the foreign gas method for the determination of cardiac output in man and are concerned chiefly with errors introduced by alterations in the oxygen consumption and blood flow recirculation of the foreign gas and changes in the total volume of the lung bag system during the re-breathing.

In the third chapter is a report of studies in cardiac output by the author's method in normal individuals and those with arterial hypertension. The conclusion that the output is not changed in arterial hypertension is in agreement with that of other recent workers.

The final chapter is a presentation of a theory of the pathogenesis of hypertension in renal disease. This involves the assumption of a pressor substance in the blood stream capable of being formed and excreted by the kidney. Theoretical considerations and selected reports from the literature are brought forth to maintain the author's thesis. This theory is a very attractive one but will require a great deal more evidence before it can gain general acceptance.

## SUMMARY

Anaphylactic-like shock due to amidopyrine in a woman hypersensitive to this drug is recorded. Study of the leucocytes at the time and for the month following revealed no leucopenia. These observations suggest that "hypersensitivity" to amidopyrine does not necessarily lead to agranulocytosis, but in no way bear on the matter of other types of toxic action in producing neutropenia.

I am indebted to Miss Geneva A. Daland for her assistance in making the blood studies, and to the patient for her cooperation.

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## The Massachusetts Medical Society

### PROCEEDINGS OF THE COUNCIL

Annual Meeting, June 9, 1936

THE annual meeting of the Council of the Massachusetts Medical Society was called to order by the President, Dr. Charles E. Morgan of Somerville, in the Ballroom of the Hotel Kimball Springfield, on Tuesday, June 9, 1936 at 10:30 o'clock. There were 177 Councilors present, the list will be found in Appendix No. 1.

The President announced that the record of the previous meeting had been published in full in the *New England Journal of Medicine* for March 12, 1936. The Secretary called attention to an error in the published record. Dr. Levi of Middlesex South had presented a resolution calling for the publication of names and addresses of those applying for Fellowship. The resolution was received and was referred by the President to the Committee on Medical Education and Medical Diplomas. The previous record was in error in that it stated that the resolution had been adopted. The record as corrected was declared approved.

The President proceeded to read obituaries of those members of the Council who had died since the last meeting.

DR. FRANK HORACE CLAPP of North Grafton, Massachusetts died at his home February 26, 1936. He was born in 1861. After graduating from the University of Vermont, he studied at the University of Vermont College of Medicine and graduated in 1888.

Dr. Clapp was a fellow of the Massachusetts Medical Society and also of the American Medical Association. He formerly served as President of the Worcester District Medical Society and was a Councilor at the time of his death. Dr. Clapp had served on the School Committee and the Board of Health of his town for several years and was active in many civic enterprises.

His widow, a son, a daughter and a granddaughter survive him.

DR. SIMON FRANCIS CURRAN of Dorchester, Massachusetts died at his home at 104 Norfolk Street May 19, 1936.

Dr. Curran was born in 1874 and graduated from the Tufts College Medical School in 1902. His pre-medical education was acquired at Tufts College where he was prominent in athletic activities. He served as captain and later as major in the World War.

He had been in poor health since he was injured by a fall in 1935 and had recently submitted to a surgical operation at the Boston City Hospital.

Dr. Curran is survived by two brothers and three sisters.

The Council stood in silence in memory of the departed Fellows.

The roll call of the Nominating Councilors showed the following to be present:

W. D. Kinney, *Barnstable*, H. J. Downey, *Berkshire*, W. H. Allen, *Bristol North*, J. F. Burnham (Alternate), *Essex North*, H. M. Kemp, *Franklin*, G. L. Schadt, *Hampden*, J. G. Hanson, *Hampshire*, R. R. Stratton, *Middlesex East*, E. O. Tabor, *Middlesex North*, A. W. Dudley, *Middlesex South*, W. A. Griffin, *Norfolk*, W. G. Curtis (Alternate), *Norfolk South*, W. T. Hanson, *Plymouth*, John Homans (Alternate), *Suffolk*, and David Harrower, *Worcester*.

The Nominating Councilors retired to an adjacent room to discuss matters properly coming before them.

Dr. Blakely of Norfolk presented that part of the report of the Committee on Membership and Finance which refers to membership. (See Appendix No. 2.) The report was ac-

applied to the unbroken skin of the forearm and within fifteen minutes there appeared itching and a wheal 1.5 cm in diameter surrounded by an erythematous flare. A similar paste of acetylsalicylic acid was applied to the opposite arm as a control and this produced no signs or symptoms. The amidopyrine paste was immediately washed off, but in spite of this the patient, in scratching, succeeded in transferring sufficient material to her lips and to her face to produce slight puffiness.

On September 16, 1935 a complete physical examination was made. This was essentially negative. The blood pressure was 120 mm of mercury systolic and 90 mm of mercury diastolic. The urine was negative. The hemoglobin was 94 per cent Sahli (146 gm per 100 cc). The erythrocytes, leucocytes, and platelets were normal.

About noon of January 18, 1936 the patient commenced to have a headache for which she took 10 grains (0.66 gm.) of acetylsalicylic acid and repeated this dose at 4 p.m. At 6 p.m. she took 7 grains (0.46 gm.) of acetylsalicylic acid, 5 grains (0.33 gm.) of acetphenetidin, and 1 grain (0.06 gm.) of caffeine in the form of two 'empirin compound' tablets. At 8 p.m. another physician, not realizing that 'peralgia' contains  $4\frac{1}{4}$  grains (0.28 gm.) of amidopyrine to the 6 grain (0.4 gm.) tablet prescribed one such tablet which she took. Two to three minutes later the patient's mouth commenced to swell, her ears became hot, and itching and tinglings were noted. Generalized muscular twitching occurred, followed by collapse with unconsciousness for about two minutes at 8:15 p.m. Adrenalin chloride 0.6 cc of a 1:1000 solution was administered subcutaneously. At 8:25 p.m. the patient again lost consciousness and was just regaining it when I first saw her. Her face, lips, eyes and hands were swollen. The skin where not edematous, was of an ashy cyanotic hue. The pulse was not perceptible at the wrist. The heart sounds were feeble, tic-tac in quality, rhythm regular rate 120. The blood pressure could not be measured in the brachial artery. The lungs were filled with fine moist râles and also showed some sibilant

râles. At 8:30 p.m. the blood pressure was obtained at 70 mm of mercury systolic and 50 mm of mercury diastolic. At 8:35 p.m. difficulty in swallowing and hoarseness were first observed. Between 8:36 and 8:39 p.m. 10 cc of 10 per cent calcium gluconate were administered intravenously. At 8:46 p.m. the color was better, breathing less labored and the blood pressure 125 mm of mercury systolic and 75 mm of mercury diastolic. At 8:55 p.m. the blood pressure was 130 mm of mercury systolic and 70 mm of mercury diastolic. At 9:00 p.m. itching and dysphagia reappeared. The patient felt weaker, breathing was more difficult, the color not so good. At 9:06 p.m. 0.5 cc of adrenalin chloride 1:1000 was administered subcutaneously. At 9:12 p.m. the patient was better, blood pressure was 90 mm of mercury systolic and 60 mm. of mercury diastolic. She was drowsy but breathing more easily. At 9:40 p.m. the blood pressure was 105 mm of mercury systolic and 55 mm of mercury diastolic. Heart sounds were of fair quality with a soft systolic murmur at the apex. The lungs were clear on auscultation. Ten minutes later vomiting occurred and continued for about an hour. At 10:30 p.m. the swelling of the face, lips, eyes, and hands had subsided considerably. There was a loose bowel motion at 10:45 p.m. The blood pressure remained about 108 mm of mercury systolic and 68 mm of mercury diastolic. At 12 midnight the patient felt weak but hungry, and after eating some crackers fell asleep. Next morning examination was essentially normal. The pulse was 72, blood pressure 120 mm of mercury systolic and 80 mm of mercury diastolic, temperature 98.7°F. The diagnosis of nonfatal anaphylactic shock with edema of the skin, larynx and lungs together with acute vasomotor collapse seemed justified. The patient has remained in perfect health since this last unfortunate episode.

The blood findings during the attack and for the next four weeks are shown in the table. No significant reduction in the numbers of polymorphonuclear leucocytes occurred at any time during this period.

TABLE 1

TOTAL AND DIFFERENTIAL LEUCOCYTE COUNTS FOR FOUR WEEKS AFTER THE OCCURRENCE OF ACUTE ANAPHYLACTIC LIKE SHOCK DUE TO AMIDOPYRINE

Date	White Blood Cells per cu mm	Polymorphonuclear Neutrophils	Stab Forms	Eosinophils	Basophils	Small Lymphocytes	Large Lymphocytes	Atypical Lymphocytes	Young Lymphocytes	Monocytes	Young Monocytes	Metamyelocytes
1-18		465	110	30	0.5	275	50		10	50		0.5
1-19	7200	615	125	20		120	50	25		40	0.5	
1-20	12400	495	165	30		135	115			60		
1-21	17900	535	140	45	1.0	115	40	45		65		0.5
1-22	11400	550	115	15	1.0	95	95	45	1.0	55	1.0	
1-23	9625	535	80	20	1.0	140	95	35		80	0.5	
1-24	10,450	590	75	25	1.5	90	30	40		75	1.0	
1-25	14220	650	50	25	0.5	150	30	35		55		
1-26	10750	665	60	35		155	15	05		65		
1-27	11,800	550	100	20	1.0	110	70	65	1.0	60		0.5
1-28	10000	530	105	20		185	55	45		60		
1-31	12400	650	30	25	0.5	135	85	20		50		
2-8	14300	550	90	20	2.0	110	90	40		50	3.0	
2-16	11950	605	70	50	0.5	110	35	60	1.5	50		

SPECIAL COMMITTEES

*Cancer*

The Secretary read the report of the Committee on Cancer (See Appendix No 9) The report was accepted

*Postgraduate Instruction*

Dr Parkins of Suffolk Secretary of the Committee read the report (See Appendix No 10) It was accepted by vote Dr Schadt of Hampden stated that it had been his privilege to serve as chairman of the Hampden District in connection with the postgraduate courses and he felt that it would be appropriate to express the appreciation of the Society for the excellent work which had been done by the members of the faculty of instruction This was incorporated in a motion which was duly passed In the report of the Committee on Postgraduate Instruction it was recommended that the courses be continued for another year and upon presentation of this recommendation it was duly voted to adopt it Dr Parkins moved that the Society send a vote of sympathy to Dr Ober a hard-working member of the Committee, who had met with an automobile accident and who was at that time confined to bed The motion was duly seconded and passed

*Physical Therapy*

The Chairman Dr Lowry of Middlesex South, presented the report of the Committee on Physical Therapy (See Appendix No 11) This was accepted

*Public Relations*

The President stated that as Chairman of the Committee he would delegate to its Secretary Dr Bagnall of Essex North the reading of the report of the Committee The report had been published in the *Journal* and was also available in pamphlet form Dr Bagnall then proceeded to read certain sections of the report

1 After careful consideration of a petition for the establishment of a section for school physicians and a study of the sections already in existence including Pediatrics it was recommended that no action be taken on the petition at this time The recommendation was accepted by vote

2 The Committee had made a study of the Washington Plan but had no definite recommendation to make at this time This section of the report was accepted by vote

3 The Committee reported that the Subcommittee on Social Legislation and Insurance (Dr M A Tighe) is continuing its activities in the education of the public regarding the evils of compulsory sickness insurance

4 The Subcommittee on the Adequacy of Medical Care (Dr E L Hunt) has continued

its study particularly in Worcester County Its final conclusions and recommendations will be presented at a subsequent meeting At this time, however the general Committee presents certain recommendations to the Council for its approval

I That each district society be urged to form within its area Medical Service Councils composed of carefully chosen representatives of its own membership representatives of welfare agencies, hospital boards health and welfare departments nursing and dental societies and the general public The functions of these Councils to be

1 Education of the public in the needs and possibilities of medical service preventive as well as curative and in the ways available for securing it

2 Making provision for suitable clinics or district visiting services where need is found (rural and factory village areas)

3 Securing co-operation in its program from industrial fraternal, social and health organizations

4 Establishing welfare department responsibility for and intelligent administration of medical care for the indigent and near indigent in each town and city by

a Employing the licensed physicians of the community at reasonable pro rata fees

b Subsidizing licensed practitioners to locate where there are no resident physicians

5 Influencing established hospitals to broaden their function so as to serve as health centers in co-operation with local health departments and as welfare centers in co-operation with local welfare departments

6 Promulgating locally organizing and thereafter serving as an advisory body in the administration of any programs of voluntary insurance for hospitalization and medical care which may receive the approval of the State Society

II That a State Medical Service Council of similar constitution be developed whose functions shall be to co-ordinate the work of the local Councils, advise as to methods study legal relations and devise enabling statutes when necessary to simplify procedures and increase efficiency in carrying out the primary purpose of promoting better health by bringing adequate medical care to the people and relieving economic distresses which are detrimental thereto

The recommendations were duly adopted by vote As a result of the study on prepayment hospital insurance the Public Relations Committee recommends that

A. The Prepayment Hospital Plan outlined in the report of the Public Relations Committee today be endorsed in principle by the Massachusetts Medical Society B this approval being accompanied by a recommendation that the plan be referred to the Public Relations Committee for further conference with the Boston Hospital Council and others who may be concerned to the end that certain details may be worked out to the satisfaction of all

After considerable discussion it was finally voted to adopt the recommendations of the Committee

5 The Committee on Public Relations recommends the following

cepted and the recommendations adopted. Inasmuch as the report contained a recommendation regarding Honorary Fellowship, the President asked for a specific vote on this item and it was voted that Dr Frederick H Pratt of Wellesley be elected to Honorary Fellowship in the Society.

Chairman Blakely stated that the Committee recommended that the surety bond of the Treasurer in the amount of \$15,000 be renewed for one year from June 19, 1936. The recommendation was adopted by vote.

The Council next proceeded to consider the petitions for restoration to the privileges of Fellowship. Four Fellows were restored by vote. For names see Appendix No 3.

The President next appointed committees to consider applications of ten Fellows for restoration to Fellowship. (See Appendix No 4.)

#### REPORTS OF STANDING COMMITTEES

##### *Publications*

The Chairman, Dr Roger I Lee, stated that there was no formal report at this time. The Committee has two duties, one to nominate the Shattuck Lecturer and the other the general supervision of the *Journal*. He referred briefly to the address of the Shattuck Lecturer on the previous evening and paid a tribute to the never-failing devotion of the Editor of the *Journal*, Dr Walter P Bowers. It was voted to accept the report.

##### *Ethics and Discipline*

The President declared the Council to be in executive session and asked all who were not members of the Council to retire with the exception of the stenographer. Dr Butler, the Treasurer was appointed to serve as sergeant at arms. After listening to an extensive report it was moved by Dr Schadt of Hampden and seconded by Dr Conley of Middlesex South that the President appoint a committee of five from the Council to consider certain matters which had been brought to the attention of the Council by the Committee on Ethics and Discipline. The motion carried and the executive session was dissolved.

##### *Public Health*

The Chairman, Dr Dwight O'Hara, presented a report which was accepted by vote. (See Appendix No 5.)

##### *Malpractice Defense*

The Chairman, Dr Franklin G Balch, presented the report of the Committee on Malpractice Defense. (See Appendix No 6.) The report was adopted.

##### *Medical Education and Medical Diplomas*

The Secretary presented the report of the Committee on Medical Education and Medical Diplomas. (See Appendix No 7.) The report was adopted.

##### *State and National Legislation*

The Chairman, President Charles E Morgan, stated that he had no formal report to make. The public press has conveyed the information that House Bill 34 was finally passed. He told of the tempestuous time experienced by the Committee and its friends and how at the last moment a conference was called in the office of the Governor and a final amendment to the bill was agreed upon. He stated that the Governor was very cordial and informed the members of the conference that the bill under consideration constituted commendable legislation, but in order to be sure that there might be adequate protection of property it would be well to allow for a specific protection in the Act. He referred to the Governor's favorable attitude toward medical matters and cited this as an additional instance. The President spoke highly of the co-operation of the members of the Society. He felt that there was enough glory for everyone who participated and had found no member of the Society who refused to carry out his assignment. He referred feelingly to his genuine pleasure at the loyal support which had been given. He stated that the matter had been handled with great care, and that, so far as he knew, there was nothing but cordial feeling on the part of the legislators toward the Society and the profession. In his opinion the Massachusetts Medical Society has now established a reputation which it must maintain. It will of necessity be forced to take its place among the civic organizations of the State and contribute constructive advice in state and national legislation.

The report was received with enthusiasm and in response to an inquiry from Dr Chapin of Hampden as to what had been accomplished, the President stated that hereafter there will be a standard which medical schools must maintain and that these standards will be set by a board consisting of the Commissioner of Education, the Commissioner of Public Health and the Secretary of the Board of Registration in Medicine. He stated that while it does not become effective until 1939 the act will allow schools an opportunity to comply with the statute, and the work of the Board in establishing standards will proceed at once.

##### *Permanent Home*

The report of this Committee was read by the Secretary. (See Appendix No 8.) The report was accepted.

SPECIAL COMMITTEES

*Cancer*

The Secretary read the report of the Committee on Cancer (See Appendix No 9) The report was accepted

*Postgraduate Instruction*

Dr Parkins of Suffolk, Secretary of the Committee, read the report (See Appendix No 10) It was accepted by vote Dr Schadt of Hampden stated that it had been his privilege to serve as chairman of the Hampden District in connection with the postgraduate courses and he felt that it would be appropriate to express the appreciation of the Society for the excellent work which had been done by the members of the faculty of instruction This was incorporated in a motion which was duly passed In the report of the Committee on Postgraduate Instruction it was recommended that the courses be continued for another year and upon presentation of this recommendation it was duly voted to adopt it Dr Parkins moved that the Society send a vote of sympathy to Dr Ober a hard-working member of the Committee, who had met with an automobile accident and who was at that time confined to bed The motion was duly seconded and passed

*Physical Therapy*

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*Public Relations*

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its study particularly in Worcester County Its final conclusions and recommendations will be presented at a subsequent meeting At this time, however, the general Committee presents certain recommendations to the Council for its approval

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3 Securing co-operation in its program from industrial fraternal, social and health organizations

4 Establishing welfare department responsibility for and intelligent administration of medical care for the indigent and near-indigent in each town and city by

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b Subsidizing licensed practitioners to locate where there are no resident physicians

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II That a State Medical Service Council of similar constitution be developed whose functions shall be to co-ordinate the work of the local Councils advise as to methods study legal relations and devise enabling statutes when necessary to simplify procedures and increase efficiency in carrying out the primary purpose of promoting better health by bringing adequate medical care to the people and relieving economic distresses which are detrimental thereto

The recommendations were duly adopted by vote As a result of the study on prepayment hospital insurance the Public Relations Committee recommends that

A. The Prepayment Hospital Plan outlined in the report of the Public Relations Committee today be endorsed in principle by the Massachusetts Medical Society B this approval being accompanied by a recommendation that the plan be referred to the Public Relations Committee for further conference with the Boston Hospital Council and others who may be concerned to the end that certain details may be worked out to the satisfaction of all

After considerable discussion it was finally voted to adopt the recommendations of the Committee

5 The Committee on Public Relations recommends the following



That the Subcommittee on Hospital Relations under the chairmanship of J Harper Blaisdell be authorized to carry a test case toward clarification of free choice of physician under the Workmen's Compensation Act, to the Supreme Court if and when a suitable test case arises, the expense to be borne by the Massachusetts Medical Society, said expense not to exceed \$500

After discussion the recommendation was adopted by vote

The President next put the question upon the adoption of the report of the Committee on Public Relations as a whole It was adopted by vote

Upon request of the President the Chairman of the Nominating Councilors, Dr David Harrower of Worcester, presented the following nominations

For President Charles E. Mongan, Somerville  
For Vice-President Channing Frothingham, Boston  
For Secretary Alexander S Begg West Roxbury  
For Treasurer Charles S Butler Boston  
For Orator Joseph W O Connor, Worcester

The President asked if there were additional nominations from the floor and, there being none, he put the question concerning the acceptance of the report of the Nominating Councilors and it was voted to accept the report Dr W A Lane of Norfolk moved that, under suspension of the rules, the Secretary be empowered to cast one ballot for the Officers and Orator as nominated by the Committee The motion was duly seconded and carried The Secretary announced that he had cast the official ballot as directed

The President expressed his appreciation of the honor conferred upon him by the Society and stated that the work had been made easy by the cordial co-operation of the other officers, the Editor of the *Journal*, the *Journal* Staff and the members of the various Standing Committees

The President then announced the appointment of the Committees for the ensuing year, and these were duly confirmed by the Council (To be published in the Proceedings of the Society)

Then followed announcements regarding the details of the local meeting Dr E H Bigelow of Middlesex South moved that a vote of thanks be extended to the local committee for the splendid hospitality which all received He stated that he had not heard a word of criticism Everyone had done all that had been asked of him and considerably more The motion was duly seconded and unanimously adopted

The Council adjourned at 12 50 p m

ALEXANDER S BEGG,  
Secretary

## APPENDIX NO 1

## ATTENDANCE

## BARNSTABLE

M E Champion  
S M Beale  
W D Kinney

## BERKSHIRE

W T Frawley  
R J Carpenter  
H J Downey  
I S F Dodd  
G P Hunt  
W P Kelly  
G H Thompson

## BRISTOL NORTH

L E Butler  
W H Allen

## BRISTOL SOUTH

J M Bonnar  
J A Barre  
E D Gardner  
I N Tilden

## ESSEX NORTH

C F Warren  
E S Bagnall  
R V Baketel  
C S Benson  
J F Burnham  
Z W Colson  
H R Kurth  
L C Peirce  
G L Richardson  
F W Snow  
W D Walker

## ESSEX SOUTH

A. E Parkhurst  
O S Pettingill

## FRANKLIN

W J Pelletier  
H M Kemp  
Charles Moline  
H G Stetson  
A H Wright

## HAMPDEN

F H Allen  
T S Bacon  
E P Bagg  
J M Birnie  
J J Carroll  
L D Chapin  
W A R Chapin  
J L Chereskin  
A J Douglas  
Frederic Hagler  
G D Henderson  
E A Knowlton  
M W Pearson  
A G Rice  
G L Schadt  
H L Smith  
G L Steele

## HAMPSHIRE

A J Bonneville  
J G Hanson

## MIDDLESEX EAST

J H Kerrigan  
Richard Dutton  
E M Halligan  
K L MacLachlan  
R R Stratton

## MIDDLESEX NORTH

F P Murphy  
A R Gardner  
E O Tabor  
M A Tighe

## MIDDLESEX SOUTH

S H. Remick  
C F Atwood  
E W Barron  
E H Bigelow  
G F H Bowers  
C O Chase  
B F Conley  
D F Cummings  
H F Day  
J E Dodd  
D C Dow  
A W Dudley  
H Q Gallupe  
W G Grandison  
N M Hunter  
C M Hutchinson  
F P Lowry  
J A McLean  
Edward Mellus  
C E Mongan  
E J O'Brien  
Dwight O Hara  
C T Porter  
W D Reid  
T E Reilly  
E S A Robinson  
E J Sawyer  
M J Schlesinger  
E F Sewall  
F G Smith  
H P Stevens  
Fresenius Van Nüys  
R H Wells  
M W White

## NORFOLK

Maurice Gerstein  
F G Balch  
H G Batchelder  
A S Begg  
D N Blakely  
D G Eldridge  
H M Emmons  
I A Finkelstein  
W A Griffin  
J B Hall  
L F Johnson  
G W Kaan  
W B Keeler  
H M Landesman  
W A Lane  
F P McCarthy  
H C Petterson  
Cadis Philpps

## NORFOLK SOUTH

T B Alexander  
W G Curtis  
G V Higgins  
F E Jones

PLYMOUTH

Charles Hammond  
L A Alley  
W T Hanson  
T H McCarthy  
J J McNamara  
A C Smith  
F F Weiner

G C Shattuck  
R M Smith  
M C Sosman  
E F Timmins  
I J Walker  
Shields Warren  
C F Willinsky

WORCESTER

SUFFOLK

Conrad Wesselhoeft  
A. W Allen  
G M Balboni  
Walter Bauer  
H L Blumgart  
W B Breed  
C S Butler  
David Cheever  
H A. Christian  
Lincoln Davis  
R L DeNormandie  
Channing Frothingham  
Joseph Garland  
G L Gately  
John Homans  
E P Joslin  
R I Lee  
C. C Lund  
L S McKittrick  
J P O'Hare  
R. B Osgood  
L E Parkins  
Helen S Pittman

R J Ward  
W P Bowers  
L R Bragg  
P H Cook  
G A Dix  
E B Emerson  
G E Emery  
J J Goodwin  
David Harrower  
E L Hunt  
E R Leib  
W F Lynch  
E C Miller  
J W O Connor  
W C Seelye  
F H Washburn  
R P Watkins  
S B Woodward

WORCESTER NORTH

Sherman Perry  
C J Laserte  
A F Lowell  
H R Nye

APPENDIX NO 2

REPORT OF THE COMMITTEE ON MEMBERSHIP AND  
FINANCE ON MEMBERSHIP

This Committee recommends

1 That the following named four Fellows be allowed to retire under the provisions of Chapter I Section 5 of the By Laws

- 1 Chenery William Elisha, Boston
- 2 Lorimer Felix, San Diego California with remission of dues, 1935 1936
- 3 Osgood George Edward St. Petersburg, Florida
- 4 Schnbmehl Frank Edward, Lynn with remission of dues, 1933 1934, 1935 1936

2 That dues of the following named eight Fellows be remitted under the provisions of Chapter I Section 6 of the By Laws

1. Berman Myer Isadore Dorchester 1933 1934
- 2 Cronin Elizabeth Ann Sullivan, Cambridge 1933 1934, 1935
- 3 Doroff Louis Abraham, Chelsea 1933, 1934 1935
- 4 Gibson David Howard Cambridge 1933 1934
- 5 McClintock Francis Blake Chelsea 1933 1934
- 6 Voorhis Kathalyn Leicester, 1933, 1934 1935 1936 (Deceased June 19 1936)
- 7 Wozmack Casimir Francis East Jaffrey New Hampshire 1933, 1934 1935
- 8 Young Roy Demas Arlington, 1934 1935

3 That the following named six Fellows be allowed to resign under the provisions of Chapter I Section 7 of the By Laws

- 1 Cottrell Martha Louis Pomeroy Sanderson Detroit, Michigan with remission of dues 1936
- 2 Gaffney Mary Evangeline Charlestown with remission of dues 1935 1936
- 3 Ham Helen Willard Middleboro, with remission of dues 1934 1935 1936

- 4 Lang Herbert Bowman South Hadley, with remission of dues 1936
- 5 Spector Nathan Moses, Philadelphia with remission of dues 1936
- 6 Whitner Harriet Wiley, Ashland, Ohio with remission of dues 1936

4 That the following named Fellow be allowed to resign on recommendation of the Committee on Ethics and Discipline under the provisions of Chapter III Section 4

- 1 Anstin Arthur Everett, Boston, with remission of dues, 1935 1936

5 That the following named nine Fellows be deprived of the privileges of Fellowship under the provisions of Chapter I, Section 8, Clauses (a) and (b) of the By Laws

- 1 Brady, Cecil Norbert, West Newton
- 2 Brown George Christopher Worcester
- 3 Fallon Joseph David, Northampton
- 4 Hagerty Harry John Worcester
- 5 Kirkwood Allan Stewart Montclair, New Jersey
- 6 Rabe, Edith Ruth Meek, Boston
- 7 Record Harold Roland, Quincy
- 8 Silberman Maurice Revere
- 9 Wood, Marshall Stephen Pittsfield

6 That the following named four Fellows be allowed to change their membership from one District Society to another without change of legal residence under the provisions of Chapter III, Section 3, of the By Laws

One from Hampshire to Hampden

- 1 Angier, Harlan Wesley Ware

Two from Norfolk to Suffolk

- 1 Monks John Peabody Brookline
- 2 Wetherell Bryant Davis, Brookline

One from Norfolk South to Middlesex South

- 1 Hewitt Wright Platt, Wollaston

7 At the last meeting of the Council February 5 1936 Dr Frederick Haven Pratt was nominated for Honorary Fellowship

Dr Pratt has received three degrees from Harvard University, A.B, 1896 A.M 1898 M.D 1906 After graduating from the Medical School he studied in Europe and then began teaching and research in Physiology He is professor of Physiology at Boston University a member of various scientific societies a research worker of international reputation and a contributor to current literature in physiology and the history of science

Our Committee heartily seconds this nomination and recommends that Dr Pratt be elected to Honorary Fellowship at this time

DAVID N BLAKELY *Chairman*

APPENDIX NO 3

REPORTS OF COMMITTEES TO CONSIDER PETITIONS FOR  
RESTORATION TO THE PRIVILEGES OF FELLOWSHIP

- (1) J R Agnew Springfield (Committee William A Hare Merrill F Hosmer and Erdix T Smith)
- (2) George E Tucker Salem (Committee Henry Tolman Jr, J Frank Donaldson and DeWitt S Clark.)
- (3) Max Tennis Boston (Committee Paul W Emerson Allan M Butler and Eli C Romberg)
- (4) Harold W Ayres Groton (Committee Archibald R Gardner James D Christie and James Y Rodger)

## APPENDIX NO 4

COMMITTEES NOMINATED BY THE PRESIDENT TO CONSIDER  
PETITIONS FOR RESTORATION TO FELLOWSHIP

- (1) For L J Dervin Somerville  
J A McLean J E Gills and Benjamin  
Rusman
- (2) For William E Buck Randolph  
C A Sullivan F W Crawford and N R  
Pillishury
- (3) For Theodore Bennett, Boston  
C J Kickham, F L Hayes and A I Shain
- (4) For William E Langevin Southbridge  
A R Moses, T L Story and S M Gihson
- (5) For Lawrence K. Kelley, Tewksbury  
J H Lamhert H W Jewett and H. L  
Leiland
- (6) For John Verdone, Boston  
G M Baihoni, F H Colby and H F  
Newton
- (7) For Aaron Kaufman, Boston  
J J Skirhall, M B Strauss and A P  
Joslin
- (8) For Arthur F Sargent Boston  
F C Hall R H. Morris and Edward  
Harding
- (9) For Daniel Wexier, New Bedford  
E D Gardner, D P O'Brien and F M  
Howes
- (10) For A. H Riordan Indian Orchard  
M. W Harrington A J Horrigan and  
G L Steele

## APPENDIX NO 5

## REPORT OF THE COMMITTEE ON PUBLIC HEALTH

The most significant public health activity in Massachusetts at the present time is the work of the Massachusetts State Health Commission, appointed by Governor Curley in 1935, and organized under the chairmanship of Dr Chadwick. The purpose of this commission is to make a study consisting of a survey of the existing health laws and practices, recognition of the points upon which they may be out of date and the making of whatever recommendations seem necessary to bring them into closer harmony with one another and with the future needs of public health administration in Massachusetts. Although this Commission will not report for several months the Officers and Fellows of the Massachusetts Medical Society are so well represented on the Committees and Subcommittees at work that the final report should be generally satisfactory to the members of the medical profession.

The development of serum treatment for pneumonia is so gradual that conservative advances are apt to be made before we are aware of them. The Committee on Public Health therefore wishes to call attention to the fact that during the past year a hivalent concentrated antipneumococcus serum for types I and II has become generally available without charge to the physicians of Massachusetts. This is provided by the State Department of Public Health and is accompanied by explicit directions for its administration. It is to be hoped both that more practitioners may employ this product and that a hivalent serum for types V and VII may become similarly available in the future.

A year ago the Massachusetts Medical Society urged that health boards and departments refrain from, and that practitioners of medicine organize

for and stimulate immunization work for people who are able to pay'. Inasmuch as Public Health officials have in general followed this suggestion the Committee on Public Health thought it would be helpful to find out how generally the practitioners of medicine were doing likewise. Diphtheria is not only one of the two diseases that we know we can prevent, but is the third leading cause of death for children between the ages of one and four in this Commonwealth. We therefore wrote to 160 doctors who had delivered 1061 babies in 17 of our smaller cities and towns between July 1 and December 31, 1934, and asked them how many of these babies had been immunized against diphtheria. This was on May 15, 1936—when these babies were from four and a half to ten and a half months beyond their first birthdays. Seventy-four physicians kindly replied (to and including June 2) and gave us the data upon which the table was constructed.

The table shows that 74 physicians who had delivered and were presumably the family doctors for 456 babies in their second years had immunized 43, or 9.4 per cent of these children against diphtheria\*. The immunizing had been done by 21 or 28.4 per cent of the 74 physicians. These 21 physicians delivered 150 of the babies and have thus immunized 28.6 per cent of their children.

Two correlations were attempted in making this survey.

Correlation No 1 with the requests on the part of the districts represented for the course in immunology offered by the Committee on Postgraduate Medical Instruction in 1935. Five towns, (B, C, D N and P) were in the districts which requested and received the instruction on immunology. In these five towns 25 physicians immunized 14 of 143 babies delivered. This is 9.8 per cent, the same as for the group as a whole.

Correlation No 2 with the number of babies delivered by each physician. Those physicians who delivered five or fewer babies immunized 13 per cent of them; those who delivered between five and twenty babies immunized 9 per cent; those who delivered twenty or more babies immunized but 4 per cent. The physicians with the larger practices thus seem to feel their responsibility the least. One man who had immunized none of the thirty-eight babies he had delivered wrote: Lack of proper public health education is responsible. The situation in this town is deplorable.

The samples secured in this survey are too small from which to draw conclusions. It can only be said in summary that approximately one quarter of the practicing physicians are immunizing approximately one quarter of their babies against diphtheria in the second year of life. The total immunization in the second year of life is less than 10 per cent. It is as yet unaffected by postgraduate medical instruction. It is adversely affected by the size of the practice of the individual physician.

Although the Subcommittee on Public Education has held no meetings during the past year, its chairman and secretary have continued to act for the Society in sponsoring the series of weekly broadcasts given in collaboration with the State Department of Public Health. These have been lengthened from nine to fourteen minutes and it is estimated that they have an audience of between ten and twelve thousand each week. Approval of material has been refused in two instances on the ground that the copy seemed to be primarily com-

The immunization of 30 per cent of the children under five years of age was apparently necessary to secure control of diphtheria in Auburn N. Y. Godfrey E. S. Jr. Am. J. Pub. Health 22:42 (March) 1932. Study in epidemiology of diphtheria in relation to active immunization of certain age groups.

mercial instead of educational. The use of more elaborate introductions than those originally prescribed for our broadcasts has crept in for some of our speakers as well as the printing of their names in the press radio programs which we formerly forbade. These trends in medical publicity have been commented upon in previous reports. The increasing complexity of the situation arises in its ethical rather than its educational aspect however and we do not feel that medical opinion is yet sufficiently crystallized to suggest when and where lines should be drawn.

Respectfully submitted  
Dwight O Hara, *Chairman*

## APPENDIX NO 6

### REPORT OF THE MALPRACTICE DEFENSE COMMITTEE FOR 1936

Again the Malpractice Defense Committee has had a very uneventful year to record. The Committee has not been called together as a whole during the year. We have not been informed of any grossly unfair testimony. It must be borne in mind that unfair testimony is not necessarily testimony against the defendant. The chairman believes that a doctor has a perfect right to testify for a plaintiff, the important point being that he give unprejudiced frank testimony. It seems to him that there has been less of this unfairness in late years surely less has been brought to the attention of the Committee.

We have had during the year two new cases. We had pending at the beginning of the year twelve cases. Three of these have been finished satisfactorily.

Again this year we are well within our appropriation.

FRANKLIN G BALCH *Chairman*  
ARTHUR W ALLEN *Secretary*

## APPENDIX NO 7

### COMMITTEE ON MEDICAL EDUCATION AND MEDICAL DIPLOMAS

During the past year the Committee on Medical Education and Medical Diplomas has held two formal meetings at which various candidates from unapproved medical colleges were examined. This aspect of our work continues about as usual. In spite of the By Laws of 1934 in which it is stated that such candidates should be recommended in confidential communications by a number of colleagues who are Fellows of the Society, the communications which we receive still continue to be perfunctory and on the whole are not likely to be confidential. Thus the Committee has found it difficult to obtain real information regarding candidates to be examined. Membership in the Massachusetts Medical Society continues to be very desirable because hospitals in increasing numbers are living up to the regulation that no doctor shall become a staff member who is not a Fellow. The Committee's work would be more satisfactory if as much confidential information as is possible could be in our hands prior to the dates of the examination.

Two years ago the Committee was directed to co-operate in an effort by the Society for improving the Medical Licensure Act of the Commonwealth.

While the Committee has had no direct hand in the passage of the new law recently enacted, nevertheless it takes great pleasure in complimenting the President and the members of the Society who were instrumental in accomplishing what our Committee two years ago failed to do. To have had the new law passed is a fine achievement.

The Committee has continued to keep itself informed regarding progress and changes in medical education and hospitals in various parts of the country. Two representatives of our Committee attended the Mid Winter Educational Conference of the American Medical Association and took an active part in discussions.

The Committee has watched with pride the interest in Postgraduate Medical Education that has been developed by the Society within the last few years. It is an interesting fact that efforts begun by the Massachusetts Medical Society in Postgraduate Instruction have been largely followed by several other state Societies. The doctors of Massachusetts appear to have been interested in the plan and have co-operated with it heartily so that on the whole, Postgraduate Instruction by our Society appears to be one of its activities well worth encouraging.

Another phase of educational activities that is of interest is the annual fifty-dollar prize offered by the Society for the best paper written by an intern in one of our hospitals approved for intern training. This is the second year in which the prize has been offered. While the papers submitted have not been numerous yet the quality of this type of work is now better than it was a year ago. To offer interns a chance to write papers in a competition of this sort appears to be a stimulating endeavor. The Committee on Medical Education and Medical Diplomas feels that the prize is worth continuance and that as the years go on more and more valuable material will be gathered and the quality of intern work is likely to improve by virtue of a competition of this character.

Respectfully submitted  
REGINALD FITZ *Chairman*

## APPENDIX NO 8

### COMMITTEE ON PERMANENT HOME

Dr A S Begg *Secretary*  
Massachusetts Medical Society

Dear Sir

The Committee on Permanent Home has the honor to submit the following report to the Council of the Massachusetts Medical Society for the year ending June 8 1936.

The note of the Boston Medical Library for \$24 500 00 which was held as a part of the Building Fund became due on April 1 1936. A capital payment of \$4 500 00 was made reducing the note to \$20 000 00 together with interest due to April 1, 1936 at 4½ per cent. The Committee recommended to the President and Treasurer that the note for \$20 000 00 be renewed for two years at 4¼ per cent, and this was done.

The Building Fund on December 1, 1935 is reported by the Treasurer as \$55 997 37.

Respectfully submitted

C G MIXTER  
J M BIRNIE  
C S BUTLER  
E C MILLER  
R B GREENOUGH

June 8 1936

## APPENDIX NO 9

## COMMITTEE ON CANCER

June 8, 1936

Dr A S Begg, Secretary,  
Massachusetts Medical Society

Dear Sir,

The Committee on Cancer has the honor to submit the following report to the Council of the Massachusetts Medical Society for the year ending June 8, 1936

The development of the courses for Postgraduate Instruction, by the Massachusetts Medical Society, has made it unnecessary and undesirable for the Cancer Committee to promote additional cancer lectures and demonstrations in the past year. The members of the Committee have been active, however, in an advisory capacity in relation to the unique cancer education program developed by the Massachusetts Department of Public Health under Dr Lombard. This program involves the stimulation of cancer instruction to the laity in small social groups. This instruction is given by local physicians of their own selection or by assignment of the local committee. To aid the physician in the preparation of such lectures, printed material containing up to date information on cancer in its various locations is provided by the Department. In this way the physician is aided in bringing his own information up to date while the public is given reliable information on cancer by an individual in whom their confidence is already established. More than five hundred such addresses in one hundred and ten out of three hundred and fifty communities throughout the State have been given in the past twelve months.

Respectfully submitted,

FRANKLIN G BALCH  
E M DALAND  
P E TRUESDALE,  
C C SIMMONS  
R B GREENOUGH *Chairman*

## APPENDIX NO 10

## REPORT OF THE COMMITTEE ON POSTGRADUATE INSTRUCTION

Mr President and Members of the Council

In 1932 a committee was appointed to study the feasibility of organizing a postgraduate department to provide instruction for the Fellows of the Society. This committee reported in June 1933 the Society adopted the recommendations, viz that a faculty be organized and that postgraduate courses be made available the following autumn. Since then, courses have been offered each year. On May 29, 1936 the Third Annual Postgraduate Extension Course was finished. The general plan of the two previous years has been followed. Slight changes have been made in the curriculum and in the organization of the faculty in order to improve the quality of the instruction.

The committee wishes to report that the faculty has contributed much time thought and effort to the organization and presentation of the postgraduate courses. The Society is indeed fortunate to have the loyal support of this teaching group of Fellows. A list of the faculty for the past year is appended.

Since January, 1936 the committee has had two joint meetings with the district chairmen of postgraduate instruction. The work of the committee has been guided by the suggestions and criticisms

of this group. Whatever success has been achieved in this undertaking to provide postgraduate instruction for the Fellows of the Society has been largely due to the enthusiasm and hard work of these district chairmen. The work of the chairman is a labor of love and as such merits high praise. The committee urges the district societies to give their loyal and active support to the work of organizing the postgraduate courses.

The record of attendance for the whole Society is as follows

1933-34	1002
1934-35	834
1935-36	598

From the record high attendance of the first year there was a decrease the second year of seventeen per cent, and forty per cent the third year. The marked drop in attendance the past year is partially accounted for by the fact that a few groups did not take any course during 1935-36. A detailed table of attendance is appended.

The financial report of the committee as shown in the last annual report has been brought up to date as of June 1, 1936. This shows an operating deficit of \$130.18. During the past five months the committee has made a careful study of the finances of this work. They wish to report that operating expenses have been materially reduced while at the same time the quality of instruction has been improved. This has been verified by reports from the district chairmen. A detailed statement of income and expense is appended.

After having two conferences with the district chairmen the committee decided to present the postgraduate courses again for the academic year 1936-37. A curriculum has been prepared and is now in the hands of the district chairmen.

The committee recommends that the postgraduate extension courses be continued for the academic year 1936-37 and urges that every Fellow co-operate in this first effort of an organized medical society to carry on a formal postgraduate school.

Respectfully submitted

FRANK R OBER, *Chairman*,  
LEROY E PARKINS, *Secretary*

## FACULTY—1935-1936 SESSION

## Arthritis

Frank R Ober, *Chairman*

Joseph S Barr	Robert T Monroe
Albert H Brewster	H Archibald Nissen
William T Green	Robert B Osgood
Francis C Hall	Thomas H Peterson
Albert A Hornor	Robert T Phillips
Chester S Keefer	Loring T Swalm

## Cancer

Robert B Greenough, *Chairman*

Earle M Chapman	Joe V Mells
David Cheever	Dudley Merrill
Fletcher H Colby	Richard H Miller
E Granville Crabtree	Langdon Parsons
Ernest M Daland	William C Quinby
Richard Dresser	Horatio Rogers
Charles E Dumas	Channing C Simmons
Harry F Friedman	George G Smith
Roger C Graves	Merrill C Sosman
Anbrey O Hampton	Charles L Swan Jr
George A Leland Jr	Grantley W Taylor
Charles C Lund	Shields Warren
Leland S McKittick	

*Dermatology*

E Lawrence Oliver Chairman  
 John Adams Jr  
 J Harper Blaisdell  
 C Guy Lane  
 Jacob H Swartz

*Diseases of the Liver*

Chester M Jones Chairman  
 F Dennette Adams Leland S McKittrick  
 Howard M Clute William R. Morrison  
 E Stanley Emery Edward L Young Jr  
 Channing Frathingham

*Immunology*

Henry D Chadwick Chairman  
 Gaylord W Anderson  
 Roy F Feemster  
 Walter W Lee  
 Elliott S A Robinson

*Kidney and Bladder Diseases (Medical)*

James P O'Hare Chairman  
 David Ayman John M Flynn  
 Earle M Chapman Lyman H. Hayt  
 Laurence B Ellis W Richard Ohler

*Kidney and Bladder Diseases (Surgical)*

William C Quinby Chairman  
 Richard Chute George C Prather  
 Fletcher H Calby Channing S Swan  
 Sylvester B Kelley Bancraft C Wheeler

*Lung Diseases*

William H Rabey Chairman  
 Theodore L Badger Richard H Overholt  
 Maxwell Finland Joseph H. Pratt  
 Cleveland Floyd Samuel H Proger  
 John S Harter George L Stivers  
 Donald S King John W Strieder  
 Frederick T Lard Richard H Sweet  
 Harlan F Newton

*Ophthalmology and Otolaryngology*

J Herbert Waite Chairman  
 William P Beetham Philip E Meltzer  
 Paul A. Chandler Charles T Porter  
 Edwin B Dunphy Lyman G Richards  
 Carl H Ernlund Francis L Welle  
 Trygve Gundersen

*Neurological Aids in the Diagnosis and Treatment  
 of Disease from the Medical Viewpoint  
 Problems of History and  
 Examination Etc*

Henry R Viets Chairman  
 James B Ayer  
 Edwin M Cole  
 Abraham Myerson  
 Tracy J Putnam  
 Houston Merritt

*Pediatrics*

John L Morse Chairman  
 John W Chamberlain Thomas H Lanman  
 Stewart H Clifford Patrick J Mahoney  
 Lewis W Hill Warren R Sisson  
 Henry W Hudson Jr Philip H Sylvester  
 William E Ladd

*Psychiatry*

George C Caner, Chairman  
 Wilfred Bloamberg  
 Maurice Fremant Smith  
 Kenneth J Tillotson

*Syphilis and Gonorrhea*

Austin W Cheever, Chairman  
 John Adams Jr  
 Oscar F Cox Jr  
 Nels A Nelson

## ELECTIVE COURSES

*Accident Work in Cases Covered by Insurance, Etc  
 Industrial Surgery and Medico-Legal Problems*

Frederic J Cattin  
 Mr Charles Haran  
 Joseph H Shartell

*Gastroenterology*

E Stanley Emery

*Latest Developments in Endocrinology*

Joseph C Aub  
 Oliver Cope

*Medical Economics  
 Channing Frathingham*

*Obstetrical Problems  
 Alanzo K. Paine*

*Peripheral Diseases of Blood Vessels*

Howard F Raat  
 Reginald H. Smithwick

*Review of the Principle of Dietetics*

William P Murphy  
 John Talbat

*Review of Recent Progress in Medicine*

Lewis M Hurxthal

## POSTGRADUATE EXTENSION COURSES

*Attendance*

District	1933-34	1934-35	1935-36
<i>Barnstable</i>			
Hvannis	31	32	29
<i>Berkshire</i>			
Pittsfield	74	61	44
<i>Bristol North</i>			
Attleboro	19	13	*
Taunton	25	21	16
<i>Bristol South</i>			
Fall River	23	22	14
New Bedford	51	44	40
<i>Essex North</i>			
Haverhill	64	38	22
<i>Essex South</i>			
Salem	62	53	66
<i>Franklin</i>			
Greenfield	29	37	20
<i>Hampden</i>			
Holyoke	40	55	26
Springfield	60	48	50

<i>Hampshire</i>			
Northampton	40	22	32
<i>Middlesex East</i>			
Melrose	32	26	14
<i>Middlesex North</i>			
Lowell	59	49	30
<i>Middlesex South</i>			
Cambridge	81	65	71
<i>Norfolk</i>			
Boston City Hospital	30	*	*
Faulkner Hospital	10	25	*
Norwood	39	28	29
<i>Norfolk South</i>			
Quincy	29	35	21
<i>Plymouth</i>			
Brockton	53	32	27
<i>Suffolk</i>			
Boston	*	21	*
<i>Worcester</i>			
Milford	*	30	24
Worcester	110	32	*
<i>Worcester North</i>			
Ayer	20	16	*
Fitchburg	21	29	23
	1002	834	598

\*Course omitted

The annual financial reports of the Committee on Postgraduate Instruction have been as follows

	Revenue	Expenses
1933-34	\$5 691.12	\$3 827.25
1934-35	4 704.00	6 882.12
1935-36—Fall only	2 085.50	2 652.93
From January 1 to June 1, 1936		
<i>Expense Memoranda</i>		
Registration Fees		
Received	1 287.00	
Due from Districts	520.00	
1936 Appropriation	1,000.00	
Instructors Salaries		1,187.00
District Expenses (Estimate)		100.00
Printing Programs		43.50
Miscellaneous, Postage, etc		100.00

### Secretary's Salary (January through May)

	625.00
\$15 287.62	\$15 417.80

### APPENDIX NO. 11

#### REPORT OF THE COMMITTEE ON PHYSICAL THERAPY

Your committee, during the past year, has made a survey of six of the general hospitals in Boston in an attempt to ascertain the extent to which physical methods were employed in their various clinics in association with other methods of treatment and as a means of shortening the period of convalescence.

It was discovered that only two of these hospitals can be said to be reasonably well equipped as to either apparatus or personnel to carry out such treatment.

A study of the curricula of the medical schools disclosed the fact that only one was giving a significant course on the subject and in none was didactic instruction supplemented by opportunity for the students to observe, under appropriate instruction, practical work in physical therapy. Reference to such work is made on occasion by the clinical departments but without description or demonstration. This condition places both the hospitals and the medical schools of Boston in a disadvantageous position.

As a result of a notice published in *The New England Journal of Medicine*, and personal letters sent to county medical society secretaries, the committee has been asked to supply speakers on the subject of physical therapy at several meetings of county societies. The reception of speakers has been most cordial.

Your committee is desirous of bringing to the attention of the members of The Massachusetts Medical Society by demonstration and discussion the possibilities which they already have and probably could use oftener either at their offices or at their patients' homes. Coupled with these demonstrations, a discussion of the indications for such treatment and the principles underlying their use would be made clear.

Discussions would also involve some of the possibilities, problems and necessary study involved in the more extensive use of physical therapy.

During the coming year your committee will stand ready to furnish speakers at medical meetings and to arrange physical therapy demonstrations. They would welcome such opportunity and are bold enough to believe that the practising physicians would find such demonstrations of value to them in their practice.



## A NOTE ON THE PHYSICAL EXAMINATION OF CHILDREN\*

BY FRANCIS C. McDONALD, M.D.†

THE state of nutrition of the patient is an important factor in the "resistance of the host." In infants and children rapid growth development and environmental influences easily modify this resistance. Any change in method of appraisal of the nutritional state which makes this analysis more accurate indirectly contributes to the accuracy of diagnosis, treatment and prognosis in this age group.

During the last five years in the Pediatric Teaching Clinic at The Boston Floating Hospital, several methods have been employed in an effort to make a fuller use of nutritional knowledge. A change has been made in the customary physical examination outline that permits a more accurate correlation of the nutritional history with the physical findings relating to nutrition.

The first main division of the examination has been called "Functional Dynamics" (see outline below).

All visible movements of the body and all functions, the evidence of which may be tested by four of the five senses, are observed and described. Gait and posture may be noticed as the patient enters the examining room. Voice, breathing, use of facial muscles, of external ocular muscles, of arm, leg and back muscles may be observed as the patient stands, sits, down, climbs onto the examining table or helps undress himself. The infant's efforts to arch the back, extend the head when on the abdomen, attempts to co-ordinate movements of the arms, legs, back or ocular muscles are described as seen. All pulsations, movements of peristalsis, respirations and even evidence of perspiration are observed in this initial portion of the examination. There has been an attempt to list the subdivisions in the order that they most commonly attract attention. After completing the rest of the examination a return is made to this portion to undergo a period of enforced meditation. During this period of reconsideration a mental review of groups of body functions is helpful, as for example a review of the cranial nerve group.

- |                         |                         |
|-------------------------|-------------------------|
| a Smell                 | i Swallowing            |
| b Vision                | j Taste of posterior    |
| c Ocular movements      | third of tongue and     |
| d Sensation of the face | soft palate             |
| (anterior two-thirds of | k Pulse and respiration |
| the tongue and          | l Speech                |
| palate)                 | m Movement of soft pal- |
| e Taste                 | ate                     |
| f Movement of jaw       | n Movement of sterno-   |
| muscles                 | cleidomastoid and trap- |
| g Movement of face      | ezius                   |
| muscles                 | o Movement of tongue    |
| h Hearing               |                         |

From the Pediatric Department of the Tufts College Medical School, the Boston Floating Hospital and the Boston Dispensary.

†McDonald, Francis C.—Physician, Boston Dispensary, Instructor, Pediatrics Department, Tufts College Medical School. For record and address of author see This Week's Issue, page 208.

Aside from prolonging the period of inspection a deliberate effort to observe all movement and evidence of body functions will often reward the observer by calling attention to other local signs of disease. Noting of an abnormal pulsation results in a careful examination of the cardiovascular system. Observation of splinting of the use of the respiratory muscles of one side of the chest is followed by a detailed appraisal of percussion notes and breath sounds. Evidence of inactivity of one arm or leg leads to careful testing of muscle strength and movement in extension, flexion, abduction, adduction and rotation of all the extremities. The observer becomes increasingly efficient by thus routinely concentrating the energy used for observation upon physiological units as well as upon topographical units.

The second subheading "Ectodermal Protective Layers" considers the skin over the whole body as a unit rather than as a component of some part of the body. Discovery of lesions of the finger and toenails, mucocutaneous junctions and hair are not likely to be missed if the examiner concentrates upon the body's covering layer and upon nothing else.

Subcutaneous tissue and muscular tissue layers are each appraised in their logical order. A separate estimate of the distribution, amount and tone of these tissues may be made in a fairly accurate manner even without touching the patient. Observation of the two layers of tissue which are draped about a malnourished patient in such a manner as to mould themselves to the examining table or droop flabbily to one side of an extremity or the other as the patient changes position, reveals a definitely different picture from that seen where the tissues are well rounded, more clearly defined and firm appearing. Experience permits gradation of classification. Concentration upon these tissues as layers and not as parts of the head, trunk or extremities permits comparison of firm muscular tissue of the lower extremities with contrasting flabby, sparse shoulder girdle musculature in the same child. In some instances abundant subcutaneous tissue may be differentiated from the underlying more sparse flabby musculature which it tends to mask. Accurate, specific description of the nutritional status may thus take the place of short general statements such as "— developed and — nourished white male child."

In a like manner when "The Skeletal Framework" is appraised as a whole it is considered as a supporting framework composed of calcium and phosphorous salts. Changes in structure of bones and teeth are subconsciously associated with calcium, phosphorus and vitamin D intake and metabolism. Specific interest here may include a detailed examination of the bone

structure of the skull with an accurate description of observations relating to the flat side of the face, the high eye or high and more forward ear, the greater angle from nose to one ear as contrasted with the more acute angle on the other side, asymmetrical nasal obstruction, malocclusion of the teeth, selective dental caries, malformation and hypoplasia of the teeth and even a description of asymmetry of the pharyngeal space

The examination of a series of patients as well as medical students and student nurses in this clinic during the past five years has shown that those individuals who had the most marked asymmetry of the skull also had asymmetrical nasal obstruction and a higher incidence of selective caries or hypoplasia of the first permanent molars and the central incisor teeth. Those having marked asymmetry of the skull tended to have a higher incidence of chronic sinusitis. Specific interest in examination of minor deformities of the skeletal framework results in more accurate correlation of the minor nutritional inadequacies of early childhood, teaches that many of the minor ills of adults are probably due to improper construction of their bodies during the prenatal period and first few years of life and stimulates an interest in the prevention of these minor deformities in future generations.

The main changes in the outline below relate to a more careful and thoughtful examination of the skin, muscles and skeletal framework. A study of these tissues oftentimes may give information of real value in giving a prognosis and in outlining a campaign of treatment. In any event modification of one of our most frequently used tools, the physical examination outline, may result in more complete utilization of our present store of knowledge.

### PHYSICAL EXAMINATION OUTLINE

#### FUNCTIONAL DYNAMICS

Observe all movements all functions relating to sight, touch, taste, hearing or smell

Describe

- |                                |   |
|--------------------------------|---|
| a Mental state                 | j Use of face muscles                     |
| b Emanating odors              | k Use of muscle groups of the extremities |
| c Movements of respiration     | l Use of olfactory sense                  |
| d Pulsations                   | m Evidence of perspiration                |
| e Voice                        | n Gait and posture                        |
| f Hearing                      | o Sensation to heat                       |
| g Use of eye muscles           |   |
| h Visible peristalsis          |   |
| i Use of back and neck muscles | cold touch and pain                       |

#### ECTODERMAL PROTECTIVE LAYERS

- |                            |                                 |
|----------------------------|---------------------------------|
| 1 Skin                     | Texture                         |
| 2 Hair                     | Structure                       |
| 3 Fingernails and toenails | Pigmentation                    |
| 4 Mucocutaneous junctions  | Unusual changes in skin surface |
| 5 Mucous membranes         |                                 |
| 6 Conjunctivae and sclerae |                                 |

#### SUBCUTANEOUS TISSUE

- 1 Abundance
- 2 Distribution
- 3 Tone
- 4 Turgor
- 5 Other unusual changes

#### MUSCULAR TISSUE

- |                |                 |  |
|----------------|-----------------|--|
| 1 Abundance    | 4 Power         | other than as described under dynamics |
| 2 Distribution |                 |  |
| 3 Tone         | 5 Co-ordination |  |
|                |                 |  |

#### SKELETAL FRAMEWORK

- Flat Bones
- symmetry
- Long Bones
- shape
- Joints
- Teeth
- 1 Number
  - 2 Distribution
  - 3 Caries
  - 4 Malocclusion
  - 5 Hypoplasia

#### LYMPHOID TISSUE

Cervical, inguinal, axillary, epitrochlear, etc., including adenoid and tonsillar tissue

- 1 Size (by measurement when possible)
- 2 Consistency
- 3 Sensation to patient and to examiner
- 4 Relation to surrounding structures
- 5 Relation to probable sources of drainage
- 6 Are the liver and spleen enlarged to palpation also?

#### RESPIRATORY SYSTEM

##### Upper respiratory passages

- |   |   |
|---|---|
| 1 Mouth                                 | { soft palate<br>tongue<br>alveolar margins                                     |
| 2 Nose                                  |   |
| 3 Throat                                |   |
| 4 Ears (from respiratory point of view) | (a) Signs of inflammation<br>(b) Exudate<br>(c) Foreign body<br>(d) Ulcerations |
| 5 Sinuses                               |   |

##### Lower respiratory tract and related sound phenomena

Evidences of changes in transmission of sound by tactile fremitus percussion and auscultation elicited by comparison of areas on one side with corresponding topographical areas on the other side

Evidences of interference or change in sound that might be accounted for by change in the physical state of the organs by varying portions of solid gas or liquid between the source of sound and the chest wall

#### CARDIOVASCULAR

##### Heart

- 1 Size
 

Perussion of cardiac borders (centimeters from midsternal line interspaces)
- 2 Sound phenomena
  - 1 First sound
  - 2 Second sound
  - 3 Adventitious sounds
    - (a) Character
    - (b) Time
    - (c) Location
    - (d) Change with change in posture
    - (e) Change with increased exercise

## Vessels

- 1 Palpable.
  - 1 Pulse
  - 2 Tone.
  - 3 Blood pressure
- 2 Visible
  - 1 Skin.
  - 2 Retinae

## ABDOMEN

General contour scars, intestinal patterning, herniation diastasis recti presence of spasm, rigidity or tenderness Palpation for liver spleen kidneys and other masses Percussion for movable dullness and fluid wave Auscultation to verify presence of peristalsis

## PERINEUM

*Genitalia*

Abnormalities in form or descent of testicles presence of varicocele, phimosis urethral or vaginal discharge

*Anus*

If not described under mucocutaneous junctions (Rectal examination when indicated)

## REFLEXES

A fairly complete neurological examination is incorporated in the above system with the exception of the more common 'reflexes

- |                  |                               |
|------------------|-------------------------------|
| 1 Epigastric.    | 9 Triceps                     |
| 2 Abdominal      | 10 Quadriceps                 |
| 3 Cremasteric.   | 11 Tendo-achillis             |
| 4 Plantar        | 12 Plantar flexion            |
| 5 Erector spinal | 13 Stroking of tibia          |
| 6 Facial         | 14 Squeezing of gastrocnemius |
| 7 Corneal        |                               |
| 8 Biceps         | 15 Flexing of thighs          |

## LOCAL

Any outstanding or fairly demarcated pathological process which may be best described as an entity

## MEASUREMENTS

- 1 Head circumference (greatest)
- 2 Chest (at nipple line)
- 3 Abdomen " (at umbilicus)
- 4 Extremities length (acromion process to tip of middle finger) (ant. superior spine of ilium to internal malleolus)
- 5 Sitting height.
- 6 Standing height
- 7 Temperature
- 8 Rate per minute—Heart beat Respiration
- 9 Blood pressure

METHYLENE BLUE THERAPY IN  
NITROBENZENE POISONING\*

## With A Case Report

BY HARRY D LEINOFF, M D †

A GREAT deal of interest has been shown in Methylene Blue since Geiger<sup>1</sup> reported its use in cyanide and carbon monoxide poisoning. It has been our experience recently to use this substance in a case of acute nitrobenzene poisoning with excellent results.

## CASE REPORT

CASE No 29633 The patient was admitted through the ambulance service on May 12 1935. Found by the ambulance surgeon in mild shock deeply cyanotic and moderately dyspneic he was picked up in a restaurant where he was suddenly taken sick following the ingestion of coffee and cake with some friends. The history was particularly meager because the patient did not speak English. Subsequently with the aid of an interpreter, he denied having taken any substance with suicidal intent. Nor did he think any of his friends had given him some poison. He did not recall having worn any newly dyed shoes during the past week.

The physical examination on admission revealed a white adult Greek male about thirty five years of age acutely ill. The face lips and fingertips were deeply cyanotic the rest of the body showed a milder degree of cyanosis. The breath had a sharp pungent, shoe-polish like odor which was easily de-

tected. The general appearance was that of a patient in mild shock. The eyes ears and nose were normal. The throat and mouth did not show any evidence of discoloration. All of the above tissues showed a mild duskiness with the exception of the lips which were deeply cyanotic. The heart rate was 130 per minute regular and of good quality. The respiratory rate was 32 per minute even and not at all labored. The abdomen was soft and only on deep pressure did the patient complain of some tenderness. The deep reflexes were somewhat exaggerated. The blood pressure was 130 over 70.

Within a few minutes after admission the pulse became extremely rapid the dyspnea and cyanosis increased and the temperature rose to 101.6°F. The patient complained of severe abdominal pains and lost control of his rectal and bladder sphincters becoming incontinent. His clinical condition had become much worse.

General therapeutic measures such as cisus gastric lavage enemas and sedatives had been instituted with very little relief. At this point, not knowing the exact nature of the poison and keeping in mind the possibility of the ingestion of cyanide or nitrobenzene it was decided to give the patient methylene blue intravenously. Fifty cc of one per cent aqueous solution was injected. At the same time the stomach was washed out with saline solution. As soon as this measure had been started the patient's color deepened to a dark blue. The dyspnea however did not increase. In about ten minutes the gastric washings showed a bluish tinge.

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and from that point on the patient made a dramatic recovery. The cyanosis began to decrease and within the hour the pulse and respiratory rate had dropped. The patient regained control of his bladder and rectum. At the end of this period his color had so improved that his fingernails assumed a normal pink. General supportive measures were instituted and the patient made an uneventful recovery. Subsequently he developed a moderate secondary anemia which was improving at the time of his discharge eighteen days later. His cyanosis completely disappeared in a few days.

## LABORATORY REPORTS

May 12, 1935—Dr. I. B. Kleiner of the Department of Physiological Chemistry recovered nitrobenzene from the gastric washings.

May 13, 1935—	CO <sub>2</sub> Combining	Power—	78%
	Blood Sugar—		106 mg
	The urine showed	hyaline	
	and granular casts	with an	
	occasional epithelial	cell and	
	a rare red blood	cell	
Blood Counts	May 13	May 22	May 31
Hemoglobin—	82%	45%	60%
Color Index—	1 0	0 9	0 9
Red Blood Cells—	4 100 000	2 390,000	3,180 000
White Blood Cells—	13,400	11,000	
Neutrophils—	77%	I	I
Mature—	70%		
Immature—	7%		
		These and all other	

These and all other counts showed anisocytosis, poikilocytosis and hematochromophilia and other evidences of secondary anemia.

Basophiles—	1%
Lymphocytes—	22%

May 20, 1935—Galactose tolerance test was negative for liver damage.

No spectroscopic or chemical examinations were done on the blood for methemoglobin, since the nitrobenzene was definitely isolated.

## COMMENT

This case presents a few interesting features. Unfortunately the mode of entry of the nitrobenzene was not discovered. In all probability this patient ingested the poison with suicidal intent, though he denied this vigorously. Nitrobenzene or aminobenzene (aniline) may enter the body by inhalation,<sup>2</sup> as in munition or laboratory workers.<sup>3</sup> It can be easily absorbed through the skin<sup>4</sup> from newly dyed shoes. It may be ingested with suicidal intent or given by mistake as a cough mixture.<sup>6</sup>

The symptomatology of the acute case may be delayed up to twelve hours after the substance gains entrance into the body. Cyanosis, dyspnea and shock develop rapidly as soon as the poison begins to affect the person. Although this condition in its acute stage is not considered very serious, numerous workers have reported fatalities. Von Jakse<sup>7</sup> estimates a fatality of 20 percent, Guntz<sup>8</sup> and Pratt<sup>9</sup> have reported fatalities. T. Sollmann<sup>10</sup> believes that

nitrobenzene is highly toxic, and that small doses may prove fatal. Other deaths have been reported.

As an immediate therapeutic agent, methylene blue has been used in a case of aniline dye poison by Williams and Challis.<sup>3</sup> They have also done some experimental work on animals along these lines which have confirmed their clinical observations.

As has been pointed out before, Geiger<sup>1</sup> and Brooks<sup>11</sup> have stimulated a great deal of interest in methylthionine chloride as a therapeutic agent, especially in such conditions where methemoglobin has pathologically formed in the blood. In order to appreciate the mechanism of this substance in the treatment of nitrobenzene, it is necessary to remember that nitrobenzene in its acute stage forms methemoglobin<sup>1</sup> in the blood. Thus dye (methylene blue) acts as a catalytic agent<sup>12</sup> aiding all respiratory processes throughout the body and increasing the metabolic rate. It is also important to remember that outside of the body methylene blue when mixed with blood forms methemoglobin, thus on the surface it seems to be contraindicated in those conditions where methemoglobinemia exists.<sup>14</sup> However, numerous investigators have shown that this deleterious substance does not form,<sup>15</sup> except in minute quantities which do not accumulate to any extent in the blood.

In our case a very large dose of methylthionine chloride was used producing an excellent clinical result. Macht and Harden<sup>16</sup> sound a word of warning against the use of such large doses. Unfortunately we have no precedent upon which to base our dosage in this case or similar cases.

From a clinical standpoint we obtained the same results as Williams and Challis<sup>3</sup> did in their case of aniline dye poisoning. The recovery in our case was prompt and lasting. At present in the absence of any other specific antidote in nitrobenzene poisoning it would be worth while to keep methylene blue in mind.

## CONCLUSION

Methylene blue is of distinct clinical value in the treatment of acute nitrobenzene poisoning.

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# CONGENITAL PATENT URACHUS

BY PATRICK J MAHONEY M D,\* AND DAVID ENNIS M D\*

THE urachus, formerly thought to be derived from the embryological allantois, has more recently been shown to be the remnant of the upper part of the bladder after that organ has descended along the anterior abdominal wall. According to Begg, "In embryos of 10 to 24 millimeters the bladder which at its upper part is derived entirely from the ventral cloaca reaches to the umbilicus. As development progresses the organ retains the same position but its upper part, or apex narrows more and more and becomes the urachus. The latter is simply the modified superior extremity of the bladder and owes nothing to the allantois." Normally the lumen of the urachus becomes practically obliterated, although it has been found (Begg) to retain a bore of about one millimeter. This channel, however, is completely obstructed by proliferated and shed epithelial cells and debris.

## INCIDENCE

The incidence of congenital patent urachus with discharge of urine at the umbilicus, is very rare. Cullen in his monumental work on the umbilicus, tabulates sixty-two cases. Begg has collected a total of seventy from the literature only fifty-eight of which, however he has been able to verify. Duclaux and Blondin present a series of eighty-seven cases, dating back to 1550. Among 15,000 admissions to the Brady Urological Institute there were only three presenting a patent urachus. At the Children's Hospital and Infants' Hospital in Boston, in a total of 200,000 admissions the diagnosis of congenital patent urachus (with discharge of urine at the umbilicus) has been made three times. There have been two cases of persistent urachus which did not communicate with the bladder. In a series of 3,466 necropsies from 1914 to 1935 six instances of persistent urachus have been reported as incidental findings. In none of these cases was there an umbilico-vesical fistula. It has not been the custom for the pathologists to make routine microscopic studies of the urachus. Begg, however, in his studies found

that it is not unusual for a part at least of the urachal canal to remain open during life, but the diameter remains extremely small.

## DIAGNOSIS

Because of its rarity, the possibility of the presence of a patent urachus is easily overlooked especially in an infant. However, the diagnosis and treatment of this condition are important in view of the frequency of a subsequent infection or a neoplastic change. The diagnosis especially in the early age groups and in the absence of a profuse urinary discharge may not be at all obvious. A simple omphalitis or an umbilical granuloma may simulate it but the former will usually clear up within a short time with cleanliness and the application of a suitable drying powder, while the latter yields to cauterization with silver nitrate. An omphalocele is distinguished by its covering of peritoneum and Wharton's jelly. A discharging persistent vitelline duct has a sinus running inward and may have an acid secretion similar to that of the gastric mucosa. In a patent urachus the sinus runs downward in the midline, the discharge, which may amount to only a few drops has the characteristics of urine. If the discharge is minimal, a cystogram affords a safe and simple means of demonstrating the tract.

## TREATMENT

As in every rare congenital anomaly several methods of treatment have been suggested. While the application of adhesive straps may temporarily control the condition, one could hardly expect a cure. Cauterization or ligation of the upper end, though it may stop the urinary flow, leaves behind the lower end of the urachus which may, in later life, form a diverticulum or cyst resulting in serious complications. Attempts to cauterize the entire tract either by heat or chemicals seem to us to carry with them too great a risk both in the technical procedure and in leaving behind cells which are potentially capable of undergoing malignant changes. A number have been treated by radical extirpation through a surgical opening which extended into the peritoneal cavity. Here, although cures were effected, the

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and from that point on the patient made a dramatic recovery. The cyanosis began to decrease and within the hour the pulse and respiratory rate had dropped. The patient regained control of his bladder and rectum. At the end of this period his color had so improved that his fingernails assumed a normal pink. General supportive measures were instituted and the patient made an uneventful recovery. Subsequently he developed a moderate secondary anemia which was improving at the time of his discharge eighteen days later. His cyanosis completely disappeared in a few days.

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median lower rectus incision was made below the umbilicus and by muscle retraction the opening was developed down to the bladder. The lower end of the urachus came into sight and the peritoneum around it was dissected away, avoiding entry into the peritoneal cavity. The original incision was continued upward in an elliptical manner around the umbilicus, care being taken not to go through the posterior rectus sheath from the linea semicircularis upward. The incompletely obliterated umbilical vein and hypogastric arteries were identified, dissected, and ligated. The umbilicus was dissected down to the peritoneum, revealing the upper part of the urachus. There was no associated umbilical hernia. The peritoneum was dissected free from the urachus, which was brought down under the posterior rectus sheath and delivered below the linea semicircularis (fig 3). The urachus was crushed at the urachovesical junction, ligated, and excised by the actual canter. The stump was buried with a purse-string suture. The wound was then closed in layers using interrupted silk sutures, a drain having been placed in the space of Retzius. At the end of the operation the patient was in good condition.

**Course.** The postoperative course was uneventful and the patient was discharged on the eighteenth postoperative day. He had full bladder control, and had gained one pound and four ounces during his stay in the hospital.

**Pathological Report.** The skin surface is covered by stratified squamous epithelium which shows slight down growth of the rete pegs. In the center of the skin surface one encounters a V shaped space on the edges of which the epithelium is increased in thickness and the rete pegs are more accentuated. In the depths of this cleft is a large mass

of granulation tissue characterized by well formed dilated vessels supported by numerous connective tissue cells which are laying down collagen, in the interstices of which occasional monocytes and polymorphonuclear leukocytes are seen. The corium adjacent to this is of normal texture and supports the usual skin appendages. Deep to the corium there is a thick zone of dense collagenous connective tissue with prominent small vessels. Coursing through this tissue is seen a large tubular structure lined by a thick layer of transitional epithelium. Beneath this are occasional lymphocytes. Near the tubular structure are two greatly thickened vessels which show tremendous fibrous proliferation of all coats. The lumina contain dark blue irregular material and fine granules of paler material.

**Diagnosis.** Patent urachus with chronic inflammation.

#### SUMMARY

The incidence of congenital patent urachus at the Children's Hospital and Infants' Hospital in Boston has been reported, together with a brief discussion of the differential diagnosis and treatment. Three additional cases, with a detailed report of one, are presented.

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## VERMONT STATE MEDICAL SOCIETY

### ACUTE ANAL PAIN FROM OBSCURE ABSCESES THEIR DIAGNOSIS AND TREATMENT\*

BY NEWTON D. SMITH, M.D.†

**A**CUte anal pain of obscure origin is more frequently caused by small abscesses in the anorectal tissues than is generally recognized. Few symptoms will cause a patient to seek the aid of a physician or surgeon more promptly than will acute, throbbing, persistent anal pain. The underlying cause may be apparent, as it is in the case of an ischiorectal abscess, a thrombotic external hemorrhoid or an anal fissure, but if the cause is not apparent the physician must search for an acute or subacute abscess in the anorectal tissues. The examination will require extreme care and even possibly, hospitalization but when the diagnosis has been made, the proper surgical procedure performed and rational postoperative treatment instituted, the relief afforded the patient is worth all of the effort expended. Recently, at The Mayo Clinic,

in a series of sixty consecutive cases of anorectal disease in which surgical treatment was required, five of the cases were of the type considered in this paper.

The onset of the pain may be abrupt or gradual and varies somewhat depending on the etiology but the pain is almost invariably of increasing intensity. Commonly these abscesses are of uncertain origin but in all probability they are caused by the trauma which occurs during the evacuation of a firm stool or by the presence of a small foreign object in the stool, the actual trauma is so slight that the patient is not aware of the injury at the time it occurs. These abscesses which result from unnoticed injury are gradual in their onset, in contrast to those which arise from the more apparent injury which may occur from careless insertion of the hard rubber enema tip or a large rectal tube. The onset of symptoms which arise from abscesses caused by the latter type of injury is more abrupt and it is not unusual for the patient to state accurately the exact time of the

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mortality was high because of peritonitis. We believe that radical excision, when done extra-peritoneally, is the most satisfactory method of treatment. The technique here described, that of first denuding the bladder of peritoneum, of leaving the posterior rectus sheath intact above the linea semicircularis, of dissection and ligation of the umbilical vein and hypogastric arteries, seems to offer the simplest technique consistent with a low mortality.

The age at which such an operation should be performed should be considered. It has been advocated that one should delay it until after the first year of life. To us the possibility of infection seems so great that we believe that once the diagnosis is made, assuming the baby to be in good condition, the operation should be performed. There is always danger in infancy of infection extending down the urachus to the bladder, or of extension of infection along the umbilical vein or hypogastric arteries, the latter in many cases not becoming obliterated until the infant is several weeks old.

Of the three cases of true patent urachus at the Children's Hospital and Infants' Hospital, the first was operated upon in 1919 with success, the second died shortly after an operation in 1922 from peritonitis subsequent to an infection already present in the urachus on admission, the third case, operated upon in March, 1936, is here presented in detail.

**CASE No. A199989** A one month old male infant weighing nine pounds was admitted because of a discharge from the umbilicus of two weeks' dura-

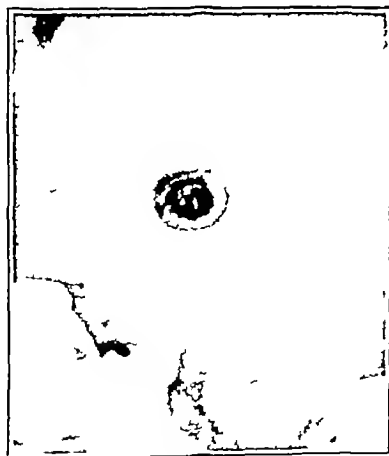


FIG 1 The umbilicus

tion. Bismuth subgallate had been applied with some improvement. Physical examination revealed a slight protrusion of the umbilicus at the end of which there was a red granulated mass one centimeter in diameter (fig 1) around which was a small amount of light yellow serous discharge. On admission the discharge gave an acid reaction to litmus paper, but subsequently gave a negative test. The discharge was insufficient for more elaborate analysis. No opening could be found with a probe but a few drops of clear fluid could be ex-

pressed. A gastrointestinal series showed no abnormality but a cystogram (fig 2) showed a well filled, smoothly outlined bladder with a narrow diverticulum like projection from the anterior sur-



FIG 2 Cystogram showing the urachus

face out to the umbilicus. This finding established the diagnosis of congenital patent urachus.

**Operation** Basal avertin anesthesia supplemented with ether was used. The bladder was filled with saline solution containing a few drops of methylene blue. The abdomen was prepared with ether and half strength iodine. A right para-



FIG 3

- A. Umbilical artery
- B. Peritoneum
- C. Right hypogastric artery
- D. Posterior rectus sheath
- E. Semicircular line
- F. Bladder
- G. Urachus

postpone inevitable surgical intervention Too frequently the pain is controlled ineffectively with suppositories which contain opiates, when neither the patient nor the physician would consider the hypodermic injection of morphine advisable unless either one or both knew the cause of the pain for which such a measure was deemed necessary Should such circumstances prevent immediate thorough examination and suitable treatment, hot wet packs applied to the anus and administration of suitable sedatives will suffice for temporary palliation

Surgical intervention is almost invariably indicated The intention of such treatment is to relieve pain and cure the condition by providing ample drainage The factors to be considered in deciding on the exact surgical procedure in each case are as follows the point of origin, the situation of the abscess, the size of the abscess, and the presence or absence of complicating diseases such as carcinoma, chronic ulcerative colitis or some other serious or prostrating illness If serious diseases such as those named are present, the minimal surgical procedure necessary to provide drainage of the abscess is all that should be attempted This usually will relieve the pain promptly, it will, of course, cause a fistula, but this can be cared for later when the patient's physical condition will permit

In considering surgical procedures, the abscesses can be divided into two groups (1) those involving the perianal tissues, (2) those involving the perirectal tissues

Perianal abscesses may originate directly from infection of anal crypts or from fissures but fissures, it should be remembered, may also follow infection of anal crypts The abscesses are directed radially, or radially and distally, but fail to reach the perianal skin Perirectal abscesses usually arise in the anal crypts, they are directed proximally or upwards Perirectal abscesses also include those which appear above the dentate margin, following injection treatment of hemorrhoids or some other actual penetrating injury

Perianal abscesses which arise at the dentate margin or anorectal line, that is, in the crypts, must be considered as potential fistulas and frequently are called blind or incomplete fistulas They are potential fistulas because they have fulfilled three of the four steps in the formation of a fistula<sup>2</sup> (1) the infection of an anal crypt, (2) the burrowing of the infection into the perianal tissues, and (3) the formation of an abscess The fourth step is not completed because sufficient drainage takes place through the involved crypt to prevent accumulation of enough pressure within the abscess to force it to the surface Therefore, in treatment of perianal abscesses which have originated directly

from an infected crypt, a probe is passed through the crypt and into the abscess cavity all of the distally overlying tissue is incised to the depth of the probe The overhanging edges are next removed to prevent the edges of the wound from adhering over its deeper portion, thus giving rise to a fistula After incision of the overlying tissues, a loose edge of mucous membrane frequently will be seen at the superior margin of the crypt through which the probe was inserted, and it is necessary to suture this edge to the underlying tissues to obtain satisfactory hemostasis and to maintain the normal relationship of skin and mucous membrane at the level of the dentate margin The perianal abscess which arises in an anal fissure should be treated similarly In treatment of either type of abscess, sufficient skin must be removed to insure that the anal portion of the wound will heal before the perianal portion This is important, it prevents formation of an overhanging edge at the anal margin which would occasion slower healing and often encourage formation of a rather persistent anal ulcer

Perirectal abscesses which arise from anal crypts may also be considered potential internal fistulas, for they follow a course identical with that of perianal abscesses except for the direction taken by the abscesses They, also, fail to rupture into the rectum In treating these abscesses, the surgeon may or may not complete the fistula If the abscess is small that is, not more than 3 cm in diameter, it is usually advisable to complete the fistula by introducing a probe through the crypt, forcing the probe through the uppermost point of the abscess cavity, and then pushing it on through the intestinal wall, into the lumen of the rectum All of the tissue interposed between the probe and the lumen of the rectum must then be incised, exposing the wall of the abscess Without particular effort, as a rule, the incision will take a direction corresponding with that of the longitudinal axis of the bowel, but in any event it is best to try to make it in this direction to prevent excessive bleeding After the incision, a continuous locked suture placed along the margin of the wound ordinarily will provide ample hemostasis This type of treatment conserves as much tissue as possible and yet insures a satisfactory result

If one of these perirectal abscesses is large and such treatment as that outlined above would entail destruction of a considerable portion of the intestinal wall and perirectal tissue, it is advisable to incise the crypt and adjacent wall of the abscess sufficiently to permit ample drainage This opening should be greater in length than the greatest diameter of the abscess cavity to prevent narrowing of the opening during the

injury The injection treatment of hemorrhoids is not a rare cause for such an abscess, but the symptoms may occur several weeks to a month or more after injection of the sclerosing agent. Under such circumstances the symptoms may be, and frequently will be, very mild in their onset. Perianal abscesses may also be secondary to another disease, such as carcinoma or chronic ulcerative colitis. It is not unusual, when a patient who is seeking relief from acute anal pain is first seen by a physician, for the discovery to be made, that the cause of this pain is secondary to a carcinoma which has progressed painlessly to the point of inoperability.

Acute, throbbing, anal pain accompanied by a definite sensation of anal spasm and general physical disability are the usual outstanding symptoms of obscure abscess. Constipation is the rule and is augmented by the fear of pain and by anorexia. The pain is definitely aggravated by evacuation of the intestinal content, and difficult urination frequently is encountered, especially among males. The patient usually will observe that he is more comfortable in the prone than in the erect or sitting position and when sitting he will often lean to one side or the other and will also prefer a firm seat rather than a cushioned one. More frequently than not the pain is intensified by any attempt at movement.

The history is remarkable because of the comparative short duration of the difficulty although it is possible, under certain circumstances, to obtain a history of repeated attacks which previously have subsided spontaneously. In cases in which the latter type of history is obtained, the abscesses may have drained amply through the point of origin, and may have recurred because of continued infection added injury or some mechanical interference with drainage.

Examination of the external portion of the anal canal may, and often does, fail to suggest the nature of the underlying lesion. There may be no discoloration, swelling or gross inequality in the appearance of the anus or perianal tissues. In other cases there may be some redness, swelling, local increase in temperature, or induration to suggest an inflammatory process. Anal spasm is usually remarkable and the tenderness may be so acute as to prevent digital or instrumental examination of the anus and rectum. The patient's general temperature may be elevated from one to three degrees and the total leukocyte count will be increased generally because of increase in the number of polymorphonuclear cells.

It may be necessary to induce anesthesia of the part in order to examine it satisfactorily. Topical applications of substances such as cocaine are of little or no assistance but sacral

anesthesia will provide an ideal field for examination and necessary operative procedures, because it offers ample anesthesia and relaxation at minimal risk, and does not cause distortion. An intelligent examination of the anus and rectum, under such circumstances, requires intimate knowledge of the anatomy of the anorectal region as well as understanding of the lesions which frequently occur there.

The examination can be logically divided into two parts: (1) the digital examination, and (2) the visual or instrumental examination. The digital examination, whether the part is anesthetized or not, must be done very gently and thoroughly because the abscess may be small and, with too forceful an examination, its content may be completely evacuated before the examiner has had the opportunity to localize the lesion to his satisfaction. The digital examination can be performed best by placing the index finger within the anus, including perhaps the lower inch of the rectum, depending on the length of the anal canal, and then, by applying the thumb of the same hand on the outside, all of the anal canal can be examined, gently, between these two members and any abnormal induration carefully noted. This bidigital examination should always precede the instrumental examination, which is of extreme importance. The instrumental examination can be accomplished with an anoscope, a proctoscope or, better still, a self-retaining anal retractor,<sup>1</sup> granting that the anorectal region has been anesthetized. The purpose of the instrumental examination is to try to determine whether a fissure is present, or if there is none, to determine accurately the anal crypt in which the infection originated. Gentleness during the instrumental examination is as important as it is during the bidigital examination, this fact cannot be stated too emphatically for it is not rare that a single drop of pus appearing in one of the crypts provides the only gross evidence of the condition for which the physician is searching. Should this drop of pus be carelessly wiped away by manipulation of the instrument, the search for the diseased crypt will be needlessly prolonged and complicated. The examination is very simple in those cases in which the abscess is secondary to a fissure or an anorectal malignant lesion because both of these lesions are apparent and the point of primary infection is frequently the open end of a cavity which is directed distally or radially.

As is frequently the case with anal pain the patient may most desire immediate relief from the pain hoping that such relief will suffice until the underlying cause has disappeared spontaneously. This desire of the patient only serves to augment the physician's responsibility, for any attempt at palliation in treatment of such an abscess as is considered here, serves only to

tion and, needless to say, a good understanding of the anatomy will avoid embarrassment. Stab incisions are a mistake. As has been shown, a well exposed field with good lighting tends to better surgery and better results.

## MISCELLANY

### VERMONT DEPARTMENT OF PUBLIC HEALTH

JUNE, 1936

The following communicable diseases were reported to the office of the Department of Public Health during the month of June: Chickenpox 108, German measles 34, scarlet fever 45, whooping cough 63, typhoid fever 4, measles 725 and mumps 72.

The Laboratory of Hygiene made 1794 examinations, the details of which are as follows:

Examinations for diphtheria bacilli	95
Widal reaction of typhoid fever	38
undulant fever	68
gonococci in pus	120
tubercle bacilli	150
syphilis	57
of water chemical and bacteriological	19
water, bacteriological	207

Examinations of milk, market	162
milk, submitted for chemical only	2
milk, submitted for microscopical only	33
foods	7
drugs	0
for courts, autopsies	3
courts, miscellaneous	18
miscellaneous	55
Autopsies to complete death returns	0

The Director of the Division of Venereal Diseases reports thirty cases of gonorrhea and forty-seven cases of syphilis made to this Division in June. Six hundred and fifty-six Wassermann outfits and two hundred and thirty-six slides for gonorrhea were distributed from this Division.

The Crippled Children's Division made one hundred and fifty-two home visits. Four patients were admitted to the Audubon Hospital and two were discharged. Thirty-five new pieces of apparatus were applied; fourteen pieces were repaired and sixty-six orthopedic corrections were made to shoes. The Vocational Worker of this Division reports sales for the month amounting to \$197.19.

Four hundred and eighty-eight notifications of birth registration and one hundred and twelve baby booklets were mailed out during the month of June.

### PREVENT VACATION DROWNINGS

It is unfortunate that very little success has been achieved in reducing the toll from accidental drownings in the United States. The death rate, in fact, was almost as high in 1934 (the latest year for which figures for the entire country are available) as it was 10 years earlier.

Accidental drownings accounted for 7,326 deaths throughout the country in 1934. Most of these fatalities were preventable, and the great majority of those that are sure to occur during the current summer could likewise be prevented.

Two characteristics of drowning accidents are especially important. First, nearly 90 per cent are those of men and boys and nearly one-half of all the water fatalities among them occur between the ages of 5 and 25 years. This shows that the most fertile field for the saving of lives from this form of accident is among schoolboys and young men. Secondly, three-fourths of the deaths occur during the five-month period May to September—that is, during the vacation season when swimming and other water sports are at their height. Less than one-tenth occur in the pursuit of regular gainful occupations and accidental drownings of this type are probably the least preventable.

It is clear that we must develop a wider applica-

tion of the principles and practice of water safety. The American Red Cross has done splendid work by way of instruction in swimming and in methods of rescue and resuscitation. The effectiveness of supervised swimming as practiced in hundreds of summer camps, has been conclusively demonstrated for it is rare indeed that a life is lost at one of these camps. Repeated warnings in the columns of the press, over the radio and on posters would help greatly. Now, at the height of the season of water sports is the opportune moment to stress the importance of these measures.—*Statistical Bulletin* Metropolitan Life Insurance Company 177 (June) 1936.

### BLACK WIDOW SPIDER ANTIVENIN

It is reported that more than 600 persons have been bitten by the black widow spider, with a mortality of 40 which marks a steady increase in the number of cases reported from southern, southwestern and western sections of the country. In view of this increase an antivenin is being prepared commercially by the hyperimmunization of sheep with repeated doses of venom from the spider. This antivenin goes under the name of Anti Black Widow Spider Serum.

process of healing, for, if such narrowing takes place, a bottle-neck type of cavity is formed and healing is perceptibly slowed or prevented. Since the opening provided is directed distally, and drainage is unhindered by mechanical factors, the abscess usually will heal without difficulty, however, it will require more time to heal than will the open wound formed in the operation advised for the smaller abscesses. This mere incision and drainage is a conservative operation and following it, intensive postoperative observation is required, but the conservation of tissue, the slight trauma, and the satisfactory result more than justify the additional expenditure of time and care.

The perirectal abscess which results from injection treatment and other penetrating trauma usually requires a "scalping" operation, that is, complete removal of that portion of the rectal wall which overlies the abscess. The base of the abscess must be examined with extreme care to avoid overlooking a tract or branch of the abscess which, at first, may not be apparent.

At the conclusion of any of these operations, a small dressing of iodoform gauze, and a small drain consisting of gutta-percha and a few folds of iodoform gauze one inch in width provide a satisfactory and comfortable surgical dressing which should be removed within forty-eight hours of the time of the operation.

The postoperative care of the wounds made in any of the operations described is based on the fact that they are infected and that although they cannot be made sterile they are not only more comfortable if properly treated but also will heal more promptly. For the relief of pain suitable narcotics are indicated after operation, as are hot wet packs, which also serve to stimulate healing. The latter can be applied for four to eight hours a day. After each evacuation of intestinal content, it is advisable to cleanse the wound and the lower third of the rectum with very warm water. A number 18 French catheter has a satisfactory and safe tip for purposes of irrigation. The wound should be inspected and dressed daily, at which time it may be irrigated with extract of Hamamch's, this may be followed by topical applications of an aqueous solution of some nonirritating antiseptic substance. Emphatically, the wounds should not be packed. It is essential that the opposing wound surfaces be prevented from adhering, but this can be best accomplished by passing a small cotton swab along the very base of the wound, beginning at the highest point in the anal canal and passing distally, this procedure should be followed by insertion to the base of the wound of a very small pledget of cotton. This pledget of cotton is allowed to project from the orifice of the wound and is left in place.

In the postoperative care of a perirectal ab-

cess, in operating on which only ample drainage was provided, it is well to determine, digitally, every second day, that the opening has not contracted and that the abscess cavity is healing satisfactorily. In these cases, two or three times a day the patient should be given hot irrigations of 500 cc of water at a temperature of 110°F. He should retain this fluid in the rectum for three to five minutes, this should be repeated until the patient has had twenty-five to thirty minutes of such treatment. This frequently will enhance his comfort and promote more rapid healing.

Although the surgical treatment of these obscure perianal and perirectal abscesses entails enough technical features to excite the interest even of the patient, the physician will realize that it is in diagnosis of them that the real difficulty lies. They are not easy to find.

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- 1 Smith, N. D. Anal retractor. S. Clin. North America 9:245 (Feb.) 1929.
- 2 Bule, L. A. Anal fistulectomy. J. A. M. A. 97:1703 (Oct. 24) 1931.

#### DISCUSSION

DR STEWART ROSS, *Mr. President, Members of the Vermont State Medical Society*—Once each year it is our privilege to meet for the purpose of obtaining some useful and workable ideas which will aid us to improve our means of caring for the sick. It seems to me that Dr. Smith has, in the present paper under discussion, brought to us something of definite value. Through his courtesy I was able to read his splendid paper before its presentation and in discussing it I felt that no greater good could be done than to summarize and emphasize briefly what seemed to me the important points for us to take home.

First. The subject. The fact that anorectal troubles have been, in the past, greatly overlooked and when thought of at all have been very lightly considered and studied was first revealed through advances in knowledge of carcinoma. Piles, fissures and visible perianal abscesses were well known but rare was the physician who was curious enough to insert his finger into the rectum. Here was something new—the obscure perianal tissue and perirectal tissue abscesses.

Secondly. The examination. It is granted that knowledge of the etiology and pathology is very desirable, but for you and me to take home workable ideas fitted for office or hospital practice the details of the proper examination as given by Dr. Smith are very important. The three important points are as follows:

1. Examine carefully with the index finger inside and the thumb outside.

2. Examine carefully with visualizing instruments.

3. Do not hesitate to use an anesthetic if necessary and when used sacral is the ideal.

I might add personally the knee-chest position has been the most favorable for examination.

Thirdly. The treatment, once a diagnosis is made is surgical. Do not procrastinate. The intention is to relieve pain and cure the condition. Surgery alone will do it and the details Dr. Smith has given us.

Careful gentle dissection including the initial incision must be carried throughout anorectal opera-

and the esophagus in this region was displaced to the right. There was no evidence of esophageal obstruction.

The patient was transferred to the Eye and Ear Infirmary on the second hospital day where she remained for two days and was discharged without further treatment.

She returned to the Eye and Ear Infirmary about one month later. She had been treated previously in the Out Patient Department with thyroid extract without any improvement in her general condition. For the three weeks preceding her return she had increasing difficulty in breathing. On the day of re-entry a tracheotomy was performed. At operation a mass of dense white fibrous tissue measuring one-half to three-quarters of an inch in thickness, was found surrounding the trachea. Biopsy of this was reported as insufficient for diagnosis. Following the operation she developed signs consistent with pneumonia. These subsided and she was discharged on the twenty-third hospital day.

#### DIFFERENTIAL DIAGNOSIS

DR. ROBERT R. LINTON: To go back and summarize this case first it is important to realize that we are dealing with an elderly woman. Her symptoms apparently began about twelve years before she came into the hospital. I think the important thing at that time was that she had spasmodic coughing spells which apparently became increasingly more frequent. I cannot see why the thumping and beating in her head and ears have anything to do with the ultimate diagnosis. It was her difficulty in breathing and in swallowing her cough and pain in the throat which really brought her to the hospital. I think it is also important to know why she had lost weight ten pounds in two months.

The physical examinations are interesting as they describe considerably more pathology on examination than was disclosed at operation. They mention that the mass extended laterally along the clavicles on both sides. It is worthy of note that her Hinton was negative. Her basal metabolic rate was if anything below normal.

X-ray examination of her long bones and of the skull I take it were negative. The calcified areas near the right femur I presume represent some old injury, probably myositis or bursitis of some nature with calcification in it.

DR. AUBREY O. HAMPTON: She had three chest examinations, one in January, one in February, and one in December. This is the last one after tracheotomy. I do not see any change in the chest or upper mediastinum except for the tracheotomy tube in that period of eleven months. She has calcification of her aorta. The heart is not grossly enlarged. There may be a little enlargement. I cannot see the shadow they describe running out along the clavicle.

DR. LINTON: That was in the physical examination.

DR. HAMPTON: This is the esophagus fairly well filled with barium and in the lateral view of the neck you get a much better impression of the location of the tumor than you do in the anteroposterior view of the neck. This black line here is the trachea and the tissue between the trachea and the spine is thickened. It extends a little behind the esophagus but it appears that there is a tumor between the esophagus and the trachea. The esophagus is displaced forward and a little toward the right. Here you can see it better but this is at a later date. Here is the trachea and here is the increase in the soft tissues behind the trachea and in front of the esophagus. The mucosa of the esophagus is normal. The picture has not changed a great deal in five months. Here is the last examination with the tracheotomy tube in position. The esophagus does not appear to be displaced at all at this time but the interval between the trachea and the esophagus is still increased.

DR. LINTON: That is increased above the normal rather than that it increased between the examinations?

DR. HAMPTON: It has not changed much from examination to examination. It is at all times  $2\frac{1}{2}$  cm in thickness and it should normally be about  $\frac{1}{4}$  mm. It is a mass about an inch in diameter between the esophagus and the trachea.

Here are the areas of calcification described in the film of the pelvis. They look like calcified inguinal glands.

DR. LINTON: I think we can quite definitely state from the physical examination that the patient was having sufficient respiratory and swallowing difficulty to require an operation. The mass described is most likely associated with the thyroid as is stated in the record. The question arises as to what type of tumor associated with the thyroid gland this is. I think the two most common things that should be considered in differential diagnosis are first thyroiditis and secondly carcinoma of the thyroid, perhaps lymphosarcoma or sarcoma. There are other things one might consider such as other types of infection but I do not believe they are worth mentioning.

Now in favor of the first diagnosis, chronic thyroiditis. I should say the consistency of the tumor, the duration of the symptoms and the character both of the tumor itself preoperatively and on the operative table are consistent with the diagnosis of chronic thyroiditis. Originally it was described as a hard gland. The first case reported in the literature was mistaken for carcinoma of the thyroid and it was only after several years of good health following operation

# CASE RECORDS of the MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED  
IN WEEKLY CLINICAL PATHOLOGIC EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

## CASE 22311

### PRESENTATION OF CASE

*First Admission* A sixty year old white woman was first admitted complaining of pain in the throat.

The patient had always been frail but remained comparatively well until about twelve years before coming to the hospital. At this time she began to notice a thumping, beating sensation in her head and ears which was accompanied by vague pain in the forehead, eyes and ears. There was concomitant visual impairment so that she became unable to read the newspaper. During this time she began to have spasmodic coughing spells which occurred at irregular intervals and persisted for about five minutes. These gradually increased in frequency and prior to entry they recurred every two to five days. Two months before admission she first noted a constricting sensation in her throat and had slight difficulty in breathing, especially after a coughing spell. At the same time she developed a constant dull ache deep within her throat and noted some painful lumps in her neck. Swallowing occasionally caused pain to radiate through the left upper chest but respiration was painless. Dry solid foods caused her to cough and during the preceding two months swallowing of these substances became increasingly difficult. For about six weeks hoarseness was present. She weighed 176 pounds two months ago and 164 pounds just before entry. She entered the Eye and Ear Infirmary two days before coming to this hospital, when examination showed slight injection of the pharynx and false cords and slight edema of the left cord and arytenoid with slight limitation of motion. An x-ray showed constriction of the trachea below the larynx, presumably of extrinsic origin.

Physical examination showed an elderly, weak looking, pallid, husky voiced woman. Both pupils were sluggish but reacted well to light and distance. A very hard, multilobulated, fixed, nontender mass was felt in the neck involving both lobes of the thyroid, extending downward to the jugular notch and laterally along the

clavicles. The cardiac rhythm was regular but low-pitched apical and basal systolic murmurs were audible. The blood pressure was 160/100. The lungs were clear and the remainder of the examination was negative.

The temperature, pulse and respirations were normal.

Examination of an uncatheterized specimen of urine showed it to be loaded with white blood cells but otherwise negative. The blood showed a white cell count of 10,300, and the hemoglobin was 85 per cent. Three basal metabolic rates ranged between -0 and -18. A Hinton test was negative.

X-ray examination of the pelvis, skull, and genito-urinary tract was negative. Situated near the neck of the right femur in the soft tissue were several calcified areas. There was a large amount of gas extending from the cecum to the splenic flexure. Films of the chest showed normal lung fields and diaphragm. The trachea showed marked narrowing of the dorso-cervical junction. There was slight calcification of the aortic knob. Fluoroscopy showed slight deviation of the cervical esophagus to the right with some retention of barium in the right pyriform sinus.

On the fifth hospital day a subtotal thyroidectomy was performed. The sternothyroid muscle was densely bound down to the thyroid gland and was dissected free with great difficulty. The right lobe was carved off the trachea. The left lobe could not be freed from the trachea and therefore only about two thirds of it was cut away. At one point what appeared to be a small abscess cavity was ruptured and a small amount of cloudy yellow purulent fluid extruded. Subsequently some of the lobe was removed piecemeal until in all about five sixths of it had been resected. The patient responded well postoperatively and was discharged on the thirteenth hospital day. Laryngeal examination just before discharge showed the left vocal cord immobile in the midline.

*Second Admission* The patient returned twenty one days after discharge complaining of dysphagia.

Since the operation the patient had been unable to swallow solid food and subsisted upon liquids, eggs, and custard. She felt that she had lost considerable weight and strength on this account. Phonation was unchanged but she was bothered by frequent accumulation of mucus in her larynx. This was relieved by inhalations but occasionally her breathing was obstructed and she felt as though she would smother although no cyanosis was present.

Physical examination was unchanged except for the well-healed operative wound.

X-ray examination of the chest and neck confirmed the previous findings. There was marked narrowing of the trachea above the sternal notch.



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that it was discovered that the patient did not have carcinoma but had chronic thyroiditis

The other possibility of course is what I shall term carcinoma of the thyroid. Points in favor of that I should say are the patient's age, and the fact that she was not relieved by operation. I think most cases of chronic thyroiditis are relieved. I also would like to state that chronic thyroiditis has an invasive character. It is locally malignant almost, in that it will grow into any tissues that are surrounding it, even into the carotid artery and the trachea at times. We have some evidence that this was an invasive growth in that it seemed to be very intimately connected with the sternothyroid muscle. It also was so intimately connected with the trachea that it was impossible to remove the thyroid gland from the trachea. As far as I can see the patient received no x-ray treatment for this tumor. If it was of the papillary adenomatous type she certainly should have received x-ray treatment. That information may have been left out of the record, but I doubt it. The other type of carcinoma of the thyroid I do not think is quite so amenable to x-ray treatment as the papillary type. So it comes down to deciding whether this is chronic thyroiditis or whether it is carcinoma, and I must admit that I have considerable difficulty in deciding, and I am afraid if I choose one it will be the other. The points on which I base my decision are the failure of it to continue its growth after an inadequate amount of surgery had been done as shown by the x-rays, the fact that the wound healed perfectly well, that there was no increase in the tumor, and that biopsy did not reveal carcinoma. I conclude therefore that it is a case of chronic thyroiditis.

DR TRACY B MALLORY: Are there any other suggestions?

DR HORACE K SOWLES: I should feel that this was probably a chronic inflammatory process but as a case of chronic thyroiditis it has some unusual elements. It is described as multilobulated and nontender. Usually chronic thyroiditis is symmetrical and stony hard, enlarged, but usually smooth, not lobulated, and at some time in its growth it is supposed to be tender. She gives no past history of pain and tenderness in the gland. Also, chronic thyroiditis very rarely has an abscess cavity in it. But in spite of all that, I think it has to be classified as chronic thyroiditis.

DR MALLORY: Dr Hertz, you saw this patient. Would you like to comment?

DR SAUL HERTZ: This patient came to the hospital with a picture that we suspected of being mild hypothyroidism. I do not know whether it is stressed in the history but she did have tenderness from time to time in her throat, and part of the dysphagia was due to tender-

ness in the gland, that is, she had truly painful swallowing. The reason I stress the picture of mild hypothyroidism is that that is valuable in a differential diagnosis. In the presence of interference with thyroid function one is more apt to find thyroiditis than malignancy. Malignancy very rarely produces a picture of hypothyroidism and malignancy very rarely produces a picture of hyperthyroidism apparently, as malignant cells are able to make thyroxin at a normal rate and not in excess, whereas a chronic thyroiditis does interfere with the epithelium and probably by cutting off the vascular supply leads to degeneration and atrophy of the thyroid cells.

It is worth mentioning that in the subsequent course of this patient's illness there was a definite palpable recurrence and she came back complaining of dysphagia. The emergency tracheotomy was done for the relief of dyspnea. The other point worth stressing in the postoperative course is that the patient was in rather poor condition. Dr Churchill saw her and felt that she certainly could not stand another operation and because of that and because of the histologic picture that Dr Mallory will tell you about, we advised that x-ray treatment be tried. It produced a remarkable effect. The patient's dysphagia completely disappeared and while the tracheotomy was in place of course she had no difficulty in breathing but she was able to close up the tube and felt perfectly comfortable within fifteen days after the first x-ray treatment. So that I think we can say this was a radiosensitive mass, that it had an invasive character, that it was probably chronic thyroiditis on the basis of the clinical picture of hypothyroidism. There may be some argument with regard to the histology but these points favor thyroiditis. Response to x-ray treatment is a new thing to us and in the literature we find no case of chronic thyroiditis which has responded to x-ray treatment.

#### PREOPERATIVE DIAGNOSIS

Chronic thyroiditis

DR ROBERT R LINTON'S DIAGNOSIS

Chronic thyroiditis

#### PATHOLOGIC DIAGNOSIS

Chronic thyroiditis, Hashimoto's struma

#### PATHOLOGIC DISCUSSION

DR MALLORY: Examination showed the thyroid gland almost completely replaced by lymphoid tissue. This lymphoid tissue is in the form of huge atypical lymphoid follicles with great germinal centers. Only here and there can you find persistent epithelial cells and these are not arranged in acinar form. No trace of

colloid can be found. In some places there is definite metaplasia to squamous epithelium. It seems astonishing in looking at the gland that the patient was not severely myxedematous rather than questionably hypothyroid. The degree of infiltration and the rate of growth in the cells in the germinal centers was so great that although we made a diagnosis of Hashimoto's struma we did not feel that we could rule out the possibility of lymphoma, and it was on the basis of that loophole that x-ray treatment was tried and proved successful. I do not think that proves it was lymphoma, however. I still think the case is one of chronic thyroiditis.

DR. HAMPTON: We had a similar case at the Baker Memorial which was referred to this hospital for treatment of Hodgkin's disease. She had previously had a tumor in the neck which responded to radiation. Then she had a recurrence with difficulty in breathing, and more radiation was requested. We had such difficulty in finding the mass that we were supposed to treat that we refused to treat her and advised operation. We also found during the course of the examination that the trachea was constricted by an annular lesion. Dr. A. Porter operated on the patient and found an annular growth of fibrous thyroid tissue around the trachea. He removed that and although her trachea enlarged after the operation she came in later with more dyspnea than before. This was rather difficult to understand since there was no recurrent mass. Until laryngoscopic examination showed a soft trachea which was apparently easily compressed. It was thought that the tracheal cartilage had degenerated from radiation but that was not so because she did not have enough radiation, and of all the carcinomas of the larynx that we have treated we have seen no such sequelae. She had a tracheotomy tube and later had no symptoms whatever. She has been well for several years without a tracheotomy tube.

DR. HERTZ: When lymphoma is found in other parts of the body, how frequently do you see it in the thyroid gland?

DR. MALLORY: It is very rare indeed. In the majority of cases that are called lymphosarcoma of the thyroid, one fails to find typical generalization of the lymphoma at autopsy and the metastases are most often limited to the lungs and bone.

### CASE 22312

#### PRESENTATION OF CASE

A seven year old schoolboy was admitted complaining of enlargement of the neck.

About a year before entry, fullness in the anterior portions of both sides of the neck was first noticed. There were no symptoms asso-

ciated with the mass and little attention was paid to it. The heart was not enlarged, the pulse rate was 92 and the blood pressure was 100/80. Two weeks prior to admission an attendant at a school for the deaf to which he went observed that the patient could not button his collar. A physician examined him at this time and noted that the fullness was resultant upon enlargement of the right and middle lobes of the thyroid. It was said also that his heart was enlarged to the left and downward and his pulse rapid (120). He had no tremor. His parents added the information that they thought he was at times more nervous than usual and that then his breathing seemed to be panting in character.

At the age of eight months the child had swollen neck glands and appeared to be drowsy. One physician thought that he had a "touch of encephalitis." There was some question in the mother's mind as to whether the patient was able to hear prior to this time but thereafter he became obviously deaf. At the age of twenty months he suddenly showed weakness of the left leg and a staggering gait. After an extended period of complete bed rest however, he regained full strength in this limb and there were no residua. Occasionally when very tired or frightened the child had spells wherein he became quite pale and limp.

The parents were perfectly well. There were two siblings, one was treated for an enlarged thymus and the other had a congenital torticollis.

Physical examination done on the evening of admission, and following a 100-mile automobile trip that afternoon, showed a well-developed and nourished boy in no acute discomfort. He was quite active, a little fidgety, and slightly apprehensive. The eyes were negative and the skin warm, moist and slightly flushed. There was a nodular enlargement of the right and middle lobes of the thyroid with no extension beneath the sternum. The enlarged gland moved readily with deglutition. The vessels of the neck were slightly dilated. No bruit was heard, although a second observer thought there was a questionable bruit over the right upper pole. The lungs were clear. The heart was regular and the rate rapid (140). The apex beat was in the fifth interspace, 1.5 centimeters lateral to the nipple line. A systolic murmur was heard in the apical region and was transmitted generally over the chest. The liver edge extended one fingerbreadth beneath the costal margin. The palms of the hands were moist but there was no tremor of the fingers.

The temperature was 98.6°, the respirations were 25. The pulse was 140 shortly after entry but on the following day dropped to 110 and on the succeeding four days gradually slowed to 90.

Examination of the urine was negative. The blood showed a red cell count of 4,300,000, with a hemoglobin of 75 per cent. The white cell count was 8,700, 60 per cent polymorphonuclears, 29 lymphocytes, 8 monocytes and 2 eosinophils. A blood cholesterol was 165 milligrams. A basal metabolic rate done in a respiratory chamber was +10 per cent and two readings on succeeding days were interpreted as normal for height and weight.

X-ray examination of the chest was negative.

Examination the following day showed no apprehension, an essentially normal heart rate, and no systolic murmur. The apex beat was in the fifth interspace at the nipple line. On the fifth hospital day, an operation was performed.

#### DIFFERENTIAL DIAGNOSIS

DR SAUL HERTZ. Obviously there was a rather rapid increase in the size of this mass sufficient to call it to other people's attention, even though the patient was deaf and could not answer questions with regard to it.

I prefer to disregard the statement that at times the child was more nervous than usual, because a child who is deaf and has paroxysms of difficulty in breathing may be quite nervous due to the fact that there is obstruction in breathing. I think any obstruction to the upper respiratory passages is sufficient to make a person nervous.

The most likely cause of weakness of the left leg and a staggering gait would be poliomyelitis or possibly a diphtheritic involvement of a peripheral nerve. The fact that this cleared up with rest in bed rules out any permanent central nervous system lesion. I do not know that these points are relevant to the mass in the neck but they are included and must be discussed. I am afraid I cannot make a diagnosis on this degree of evidence and I prefer not to.

Apparently there is a strong family history of neck disorders, but not relating to the mass which this patient had. The possibility of enlarged thymus in another child from the same family is a definite one but I do not think it needs to be considered very strongly. An important point in the physical examination is the fact that his mass did rise and fall with swallowing. That definitely locates the mass in the thyroid gland.

The nervousness and the flushing of the skin on physical examination might well have been due to excitement from the long automobile trip rather than to overactivity of the thyroid as indicated here.

I think the description of the gland is rather important because at the age of seven one does not expect a colloid goiter to become nodular, so that if we can depend on this description of the gland as being accurate I think it is a very

important point in the differential diagnosis. We are not told whether it was a single nodular goiter or multinodular, but I presume from the description that it was a single one and that the middle lobe or isthmus was possibly drawn over by a large single mass in one lobe of the thyroid.

We have a rather paradoxical statement about the bruit. In passing I might stress the importance of bruit. When one finds a definite bruit it is strongly suggestive that the gland is hyperplastic and has increased vascularity. It is a point in differential diagnosis so we should like to have a definite statement as to whether bruit was present or not.

You will notice that the tachycardia subsided to a certain extent with rest in bed in the hospital. That is consistent with our interpretation that this was a nervous boy, nervous about coming to the hospital rather than from any thyroid overactivity.

His blood showed a high normal level of monocytes. We usually find increased monocytes in patients who have definite thyrotoxicosis but the increase is frequently in the neighborhood of twelve to fifteen and sometimes as high as twenty per cent monocytes. I do not think this particular value (8 per cent) is of any help in differential diagnosis because it is so near the normal percentage.

The interpretation of the blood cholesterol is as follows. Frequently blood cholesterol values in hypothyroidism may reach as high as 500 milligrams. A normal value in this laboratory is between 150 and 200. The value given here is essentially normal and is consistent with normal thyroid function. A decrease of cholesterol in hyperthyroidism is not so regular as is an increase in cholesterol in myxedema or true hypothyroidism.

No mention is made as to whether iodine was tested out as to its possible influence on the basal metabolic rate in this case. That would have been valuable evidence to tell whether the gland had been hyperplastic or not previous to operation. If that had been tested we would have had a little better evidence to go on. We use the iodine therapeutic test as a diagnostic measure in this way: we establish the level of metabolism and then watch the course of the metabolic rate. A course downward on iodides indicates a positive therapeutic test and is very strong evidence of thyroid hyperplasia.

X-ray of the chest was negative and I do not think we need to comment further except to say that it was negative. That certainly rules out thymic tumor unless the thymus was ectopic, but I think that is unlikely.

Operation was done after five days indicating that those caring for the patient thought he was not thyrotoxic. That may have been an error, however, because of the normal metabolic

rate and without the use of iodine we cannot be certain that the gland was not toxic in some sense. On the other hand we have seen patients who have normal metabolic rates, who have mild hyperthyroidism, and who show hyperplasia of the thyroid at examination pathologically.

I think, however, that the pertinent points about this case, apart from the point of toxicity are the fact that this child who is seven years of age had a mass in the neck which increased in size rather rapidly, that the mass was probably a unilateral mass, that the increase in size could be due either to filling up of a cyst that was previously present, to a process of thyroiditis or to hemorrhage into a cyst which was previously present, to account for this increase in size, or that this mass was really an adenoma of one sort or another with rapid progression in size. Those are the three possibilities and I do not think that anyone feeling a neck could be certain with respect to differential diagnosis about this condition. The statistics from our clinic several years ago indicated that the single nodule was more likely to be an adenoma than a cyst or other pathologic findings in the thyroid. In the thyroid clinic we all do not agree that that is so, and we feel that the difficulty in diagnosing whether the case is a single nodule or not clinically is very great. We have been mistaken just as often in calling a single nodule a multiple one as vice versa because of the difficulty in palpating the thyroid.

If I were to make one guess, and that is all it is, I would choose among these three things: cystic thyroid with filling up of the cyst; a nodule with thyroiditis in it; or a papillary fetal adenoma with rapid increase in size. At this age I think the most common thing would be cyst of the thyroid that filled up. If that proves to be wrong, papillary adenoma at this age is more common than fetal adenoma.

DR HAROLD L. HIGGINS: It is practically impossible to tell whether an intelligent child is deaf before he is fifteen to eighteen months of age. Even the most observant families fail to recognize that the child is deaf. The child will respond to vibrations and the fact that he is deaf is overlooked.

My diagnosis was essentially the same as that of Dr. Hertz—a nodular or cystic goiter. We undervalued the history of episodes of thyrotoxicosis and the findings on examination on the day of admission to the hospital. It is worth mentioning, that even when the boy overcame the excitement of coming to the hospital, his heart was still enlarged. In a seven year old boy the apex beat should be in the fourth interspace and not in the fifth interspace.

We considered medical as well as surgical treatment. We felt that surgical treatment would have to be performed sometime. Al-

though the child was not very nervous the mother was and it seemed wise to operate and get this nodule out right away. On that point our consultants agreed with us. Also, at this time another child was coming to the clinic with a similar nodular mass in the thyroid and being treated medically. At times she showed hyperthyroidism and then she would show signs which approached hypothyroidism. She was not doing well and was missing a good deal of school. In view of our experience with this child we felt that with the child under discussion today the wisest thing to do was to remove the nodule.

DR ROBERT R. LINTON: I saw this boy as the surgical consultant. I felt very definitely that he had a nodular goiter which should be removed because of its size and the fact that it was growing larger. I do not think he had hyperthyroidism on physical examination. It should be pointed out that he was not a normal child because of his deafness, which I feel may have masked the usual symptoms of hyperthyroidism. The first indication I had that he had hyperthyroidism was when I exposed the thyroid gland at operation. It was exceedingly vascular and quite adherent to the surrounding structure. Both of these observations are almost always present in hyperthyroidism. The superior thyroid arteries were of tremendous size for so small an individual. Each one measured about 4 millimeters in diameter. I did a very generous subtotal thyroidectomy, leaving about 4 grams of thyroid tissue on either side rather than leaving a larger amount and running the danger of recurrent hyperthyroidism.

The postoperative course was perfectly consistent with hyperthyroidism, as he had a very typical thyroid storm. It was mild but none the less a bit worrying since he had not been prepared with iodine. He was given iodides immediately postoperatively. Fluids and glucose were pushed in order to control the postoperative reaction.

I think it should be pointed out that basal metabolic determinations, unless done with very special technique are not accurate in children and certainly a low rate does not exclude the diagnosis of hyperthyroidism.

DR JACOB LERMAN: I do not remember the patient well, I was away at that time and I came back when he was having the storm. There is very little in the history to suggest thyrotoxicosis. I suppose we should have paid more attention to the pulse rate, the enlarged heart and the mother's observations of nervousness.

I agree with Dr. Heitz that when in doubt the ideal thing is to do a therapeutic test with iodine. Even though the metabolic rate was only plus ten, one should have tried the therapeutic test. It probably would have told the whole story. Otherwise one could not suspect hyperthyroidism and would be left with a choice be-

tween such diagnoses as rapidly growing adenoma, a cyst filled with fluid or an infected cyst

#### PREOPERATIVE DIAGNOSIS

Nodular goiter

DR SAUL HERTZ'S DIAGNOSIS

Cyst adenoma of the thyroid (nontoxic)

#### PATHOLOGIC DIAGNOSIS

Hyperplasia of the thyroid

#### PATHOLOGIC DISCUSSION

DR. TRACY B MALLORY One point perhaps of considerable importance not brought out in the history is that this child was born in Detroit and lived there for several years before coming to Massachusetts, so that he did live in the goiter district

Microscopic examination showed a marked grade of hyperplasia but none of the usual lymphoid infiltration which we see characteristically in young people with exophthalmic goiter and I personally do not believe that the findings of hyperplasia necessarily confirm a diagnosis of hyperthyroidism in this case. It seems to me there are unquestionably stages in the formation of endemic goiter when hyperplasia is present before involution has occurred. It is a lesion which in this region we rarely see but Marine and other people working with goiter have seen and described. My personal inclination is to

put the case in that category rather than to consider it true exophthalmic goiter

A PHYSICIAN Were there any areas of hemorrhage to account for the increase in size?

DR MALLORY No Microscopically except for the absence of lymphoid infiltration it looks like severe hyperthyroidism

DR HIGGINS The basal metabolism of this child was made in a chamber and not with a mouthpiece. I feel that the results of the metabolism test as found in this child are reliable, that is, that they indicated the true basal metabolic rate at the time taken. In our experience with metabolism tests on children it has become apparent that the technique of the determinations is subject to a minimum of error. The chief source of error is the quietness of the child. The records show that this child was quiet throughout each determination. Therefore, the child must have been showing attacks of hyperthyroidism and not hyperthyroidism continuously.

Incidentally, it should be noted that this child was observed several years ago, the case was an instructive one and helped to formulate our present policy for handling similar cases. Medical observations under iodine therapy most certainly should be made before surgery is attempted.

A report from his local physician was sent us six months after operation, the child had a normal basal metabolism and was in perfect health.

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## THE CLINICAL CONGRESS OF THE CONNECTICUT STATE MEDICAL SOCIETY

AMONG the important medical meetings of this year in New England, that of the Clinical Congress of the Connecticut State Medical Society takes high rank. The program which appears on page 217 of this issue discloses a well arranged series of subjects which cover the important departments of medical practice. The papers scheduled will deal with the more important phases of disease and the application of therapeutic measures. Those subjects which are in an evolutionary stage will be given special attention and the clinics will be conducted by recognized authorities.

Attendance at these exercises will be of especial value to practitioners who are interested in scientific medicine. Physicians from other states are cordially invited to take advantage of the advanced instruction which will be given.

Everyone interested in keeping abreast of

medical progress should read the program and if possible, arrange to attend the Congress. This is an excellent opportunity for advanced postgraduate instruction.

## THE PROCEEDINGS OF THE COUNCIL OF THE MASSACHUSETTS MEDICAL SOCIETY

ESPECIAL attention is called to the report of the Proceedings of the Council on page 179. These records present the executive functions of the State Society and should be carefully read, for experience shows that many members either do not read these records or fail to retain the facts. While much of the text of this official document is devoted to actions consummated, there are several reports which outline opportunities for progress of an important nature in dealing with the problems incident to medical practice. That of the Subcommittee on the Adequacy of Medical Care is important. It outlines the need for education of the public and the profession through Medical Service Councils and suggests methods of approach to important problems in order to improve existing conditions.

How far the work of the Committee will be productive depends upon the effective interest shown in this report by the members of the eighteen District Societies.

Active and compelling leadership will promote the success of the plans by worthwhile organization of service to the people. If on the other hand no co-operation on the part of the general profession is forthcoming, the recommendations will be sterile. If the usual lethargic habit of a large proportion of the profession persists, nothing will be done. Some will watch with interest for the awakening of a more general and practical endorsement of the report of this committee.

The recommendation of the Committee on Public Relations, that a test case which will clarify the application of the statute relating to the free choice of physicians by injured workmen may settle that controversial matter for the future.

The report of the Committee on Public Health shows its attitude on the matter of immunization practice by the public health agencies and unfortunately demonstrates the indisposition of some doctors to answer requests for information in that one hundred and sixty doctors were asked to report the number of immunized children among their patients and only seventy-four replied. The replies are also significant because they show that of the group of 456 babies forty-three or only 9.4% were immunized against diphtheria. This will be of interest to those doctors who complain that health agen-



cies are invading the fields of the family physician

These references to the report of the Proceedings must not be construed as covering the important matters contained therein. The entire account should be read with the feeling that every member of the Society has a definite responsibility respecting the activities of this representative body. Those who are not on the roster of the Council should read carefully the Attendance Lists which appear as a part of the Proceedings from time to time, for those who habitually absent themselves should be superseded by others who will participate in the Proceedings. The Society needs the active and interested co-operation of all its members.

### THIS WEEK'S ISSUE

CONTAINS articles by the following named authors

STRAUSS, MAURICE B. A.B., M.D. Johns Hopkins University School of Medicine 1928. Assistant in Medicine and in Tropical Medicine, Harvard University Medical School. Assistant in Medicine Boston City Hospital. His subject is Allergy to Amidopyrine. Blood Studies Following Anaphylactic-Like Shock in a Patient. Page 177. Address 270 Commonwealth Avenue, Boston, Mass.

MCDONALD, FRANCIS C. A.B., M.D. Harvard University Medical School 1929. Assistant to Physician-in-Chief, Boston Floating Hospital. Physician, Boston Dispensary. Instructor, Pediatrics Department, Tufts College Medical School. His subject is A Note on the Physical Examination of Children. Page 189. Address 370 Longwood Avenue, Boston, Mass.

LEINOFF, HARRY D. M.D. New York Homeopathic Medical College and Flower Hospital 1927. Assistant in Medicine, Flower Fifth Avenue and Metropolitan Hospitals. Metabolic Clinic, Flower-Fifth Avenue Hospital. Lecturer in Medicine, New York Medical College and Flower Hospital. His subject is Methylene Blue Therapy in Nitrobenzene Poisoning. Page 191. Address 1111 Park Avenue, New York City.

MAHONEY, PATRICK J. A.B., M.S., M.D. Harvard University Medical School 1928. F.A.C.S. Assistant in Surgery, Harvard University Medical School. Assistant Surgeon, Children's Hospital, Boston, and Woolson Building for Children, Cambridge Hospital, Cambridge. Address 319 Longwood Avenue, Boston. Associated with him is

ENNIS, DAVID. A.B., M.D. Harvard University Medical School 1936. Intern in Medicine,

Strong Memorial Hospital, Rochester, N. Y. Address Strong Memorial Hospital, Rochester, N. Y. Their subject is Congenital Patent Urachus. Page 193.

SMITH, NEWTON D. M.D. University of Buffalo School of Medicine 1923. Member of Staff, Mayo Clinic. His subject is Acute Anal Pain From Obscure Abscesses. Their Diagnosis and Treatment. Page 195. Address Mayo Clinic, Rochester, Minn.

### MISCELLANY

#### CONNECTICUT NEWS

##### THE APPOINTMENT OF DR. M. A. STEVENS

Dr. Marvin A. Stevens formerly of the Yale Football Coaching Staff has been appointed an assistant clinical professor of orthopedic surgery at the Yale University School of Medicine, orthopedist at the Health Department of Yale University and a member of the Staff of the New Haven Hospital. Dr. Stevens will also continue to hold the position of head coach at the New York University.

#### WORCESTER DEPARTMENT OF HEALTH

##### ANNUAL REPORT

The report for 1935 of the City of Worcester Department of Health, under the medical direction of Dr. Peter O. Shea, shows what a modern medium sized city can accomplish in the way of health protection.

Eight cases of diphtheria with one death were reported as compared with 487 cases with 22 deaths in 1923, the first year of the diphtheria program. Fifty-four per cent of the children in the elementary school enrollment have been immunized against diphtheria. The infant mortality rate has reached a new low record of 46.2 deaths per thousand births. Ninety-eight per cent of the milk entering the city is pasteurized. The hearing of school children is tested by audiometer.

Among his recommendations to the City Council, Dr. Shea includes antirabic treatment for dogs, compulsory pasteurization of all milk sold in the city and a continued immunization program with the assistance of the medical profession and an extension to scarlet fever as indicators arise.

On the basis of this report, congratulations should be tendered to Dr. Shea, to Chairman James J. McGrath and the members of the Board of Health.

#### DR. L. E. MAYO BECOMES AN ASSOCIATE OF THE HOLDEN CLINIC

Dr. Leroy E. Mayo (Tufts College Medical School 1934), West Somerville, who has recently completed a rotary internship at Worcester Memorial Hospital, becomes an associate at the Holden Clinic August 1.

COMPARISON OF DISEASE INCIDENCE IN CONNECTICUT WITH 1935  
AND SEVEN YEAR AVERAGE

MONTH ENDING JUNE 20 1936

Diseases	1936				Average cases reported for week corresponding to June 20 for past seven years	1935			
	Week ending May 30	Week ending June 6	Week ending June 13	Week ending June 20		Week ending June 1	Week ending June 8	Week ending June 15	Week ending June 22
Anthrax	—	—	—	1	—	—	—	—	—
Chickenpox	81	79	103	69	81	94	197	130	101
Conjunctivitis Infectious	—	—	1	—	—	4	5	—	—
Diphtheria	2	2	—	3	9	7	5	2	6
Dysentery Bacillary	—	—	—	—	—	—	—	2	1
Encephalitis Epidemic	—	—	—	—	—	—	1	—	—
Favus	6	—	—	—	—	—	—	—	—
German Measles	370	431	385	268	21	257	375	323	247
Influenza	1	3	—	—	—	—	3	1	—
Malaria	—	—	—	1	—	—	—	—	—
Measles	203	218	213	107	173	592	761	667	361
Meningococcus Meningitis	—	3	2	—	—	—	1	—	1
Mumps	82	69	93	60	47	62	39	33	23
Paratyphoid Fever	1	1	—	2	—	—	11	5	—
Pneumonia (Broncho)	16	22	14	11	11	18	14	17	12
Pneumonia (Lobar)	19	28	30	22	15	34	28	19	17
Poliomyelitis	—	—	—	—	—	—	—	—	1
Scarlet Fever	17	42	62	21	35	96	64	77	46
Streptococcus Sore Throat	2	1	2	1	2	6	6	5	9
Tetanus	—	—	1	—	—	—	—	—	—
Trichinosis	—	2	—	—	—	—	—	—	—
Tuberculosis (Pul)	43	29	31	22	28	48	31	35	34
Tuberculosis (O F)	3	2	1	3	3	4	1	1	5
Typhoid Fever	2	1	1	—	1	2	2	2	1
Undulant Fever	2	3	—	3	—	1	—	—	—
Whooping Cough	80	83	74	55	50	44	65	62	49
Gonorrhea	15	53	17	37	35	31	33	40	15
Syphilis	43	75	26	53	47	43	43	46	41

Remarks No cases of Asiatic cholera glanders plague or yellow fever during the past seven years

DR. L. M. S. MINER BECOMES PRESIDENT OF  
THE AMERICAN DENTAL ASSOCIATION

Dr. Leroy M. S. Miner, Dean of the Harvard Dental School and Professor of Clinical Oral Surgery, was installed as President of the American Dental Association on July 16 at the final session of the Association's annual convention which was held at the St. Francis Hotel, San Francisco, Calif., throughout the week of July 13. Dr. Miner automatically succeeds Dr. George Winter of St. Louis in the presidency owing to his election as president-elect at the New Orleans Convention of the Association, held last November.

The honor of heading the organized dental profession in the United States has come to Dr. Miner in recognition of his accomplishments as a leader in the fields of oral surgery and of dental educa-

tion. During his twelve years as Dean of the Harvard Dental School, Dr. Miner has worked continuously for the recognition of dentistry as an oral specialty of the practice of medicine and as an important influence through the prevention of disease upon the public health.

Under his administration the School has modified its program of teaching so that its work today is more closely related than ever before with medicine through the development of oral diagnosis on a broad health basis. At the same time the School's research program has been gradually developing in conjunction with the fundamental science departments of the Harvard Medical School. This work has been lately under the direction of the Harvard University Committee on Research in Dental Medicine, whose membership includes leading scientists from the Faculty of Arts and Sciences and mem-

bers of the Medical and Dental School teaching staffs

Dean Miner prepared for the dental school at the Boston Latin School from which he was graduated in 1901 with honors. He took his D.M.D. degree from the Harvard Dental School in 1904 cum laude, and received the M.D. degree from the Boston University School of Medicine in 1907. He has been connected with the Harvard dental teaching staff since 1905, and was made Professor of Clinical Oral Surgery in 1922. He became a member of the School's administrative board in 1914, and was appointed Dean in 1924. He has been connected with the staff of the Boston University School of Medicine for more than twenty years, and was made Professor of Stomatology in 1935.

In 1933, Dean Miner received the honorary degree of Doctor of Science from the University of Pennsylvania, and was awarded the Rhode Island State Dental Society medal for distinguished service to dentistry in 1934, and the Newell Sill Jenkins Medal of the Connecticut State Dental Association in 1936.

He is a member and past president of the Harvard Dental Alumni Association, the Harvard Odontological Society, the Massachusetts Dental Society, the New England Dental Society, the American Academy of Dental Science, and the International Society for Dental Research. He is a Fellow of the Massachusetts Medical Society, the American College of Surgeons, the American College of Dentists, and the American Academy of Arts and Sciences. He is a member of the American Association of Oral and Plastic Surgeons and the American Medical Association.

In 1933 he delivered a course of lectures at the Lowell Institute, Boston, Mass., on "The New Dentistry: A Phase of Preventive Medicine" which was subsequently published in book form. He is also the author of numerous articles and publications on professional subjects and on dental education.

#### BOSTON HEALTH LEAGUE

A special meeting of the Executive Committee of the Boston Health League was held on July 8 on account of the recent death of Dr. Richard G. Wadsworth, Treasurer of the League.

It was voted that the Secretary extend to Mrs. Wadsworth the appreciation of the Executive Committee for Dr. Wadsworth's services to the Health League and its sympathy.

The selection of a new treasurer will not be made until the fall.

#### THE DOCTORS' CLUB-RESIDENCES

A letter under the above caption has been received by some doctors setting forth that a partial list of Physicians and Surgeons has been invited to serve on a general organization committee for the purpose of developing a home for aged and indigent doctors.

With this letter is a statement setting forth that

the purpose of the organization is to provide a 'refuge for members of the profession'.

The list of physicians and surgeons includes many names of national reputation and is referred to as those to whom the letters have been sent. There is no intimation that any of these persons have endorsed the project.

Several years ago a similar scheme was presented to the profession for its support, but we have not been informed that it was carried through to success.

#### THE APPOINTMENT OF DR. DERA KINSEY

Dr. Dera Kinsey, formerly of the Belmont Hospital, Worcester, Massachusetts, has been appointed resident physician of the New England Hospital for Women and Children in Roxbury.

Dr. Helen C. Provost will be assistant to Dr. Kinsey.

#### FEWER FOOD AND DRUG SEIZURES IN JUNE

Only sixteen foods and eight drug items were seized during June, the current report of the Federal Food and Drug Administration indicates. The only line of enforcement work that maintained the average of previous months was the detection of unfit cream. This campaign is now active in the West. A total of 1,033 gallons of the dirty and decomposed product was caught en route to creameries and was dumped. Unclean butter, to the extent of 585 pounds, was likewise destroyed, and 5,600 pounds of butter below the legal butterfat requirement were seized.

Scattered small lots of so-called olive oil, consisting for the most part of teaseed oil, were rounded up during June. Other economic cheats stopped by the exercise of the federal jurisdiction over interstate commerce are shown in the report.

One lot of dried peaches (3,425 pounds) was seized on charges of being dirty and insect infested, and 2,626 sacks of flood-damaged flour, 776 pounds of polluted crabmeat from the lower Atlantic and Gulf coast area, and two barrels of olives contaminated with arsenic, due presumably to the use of second-hand insecticide barrels, were picked up. The last food item recorded in the monthly statement is a chocolate flavored malted milk (216 cases seized) bearing extravagant and misleading claims as to vitamin content and food and medicinal value.

Of the eight drug items seized six were pharmaceuticals. They were the following: 465 cans of anesthetic ether and twenty-six bottles of chloroform which had deteriorated and were no longer pure; a shipment of flaccure of iodine below the legal standard for that drug; and one lot each of nitroglycerin tablets, nicotine kamala tablets, and carbon tetrachloride compound, each of which failed to meet the standard set up by its own labeling.

Two patent medicines found themselves in the toils of the law. Kojene was a water solution of oxyquinoline sulphate and sulphur dioxide flavored with wintergreen, falsely and fraudulently repre-

sented as a treatment for pyorrhea trench mouth gingivitis soft spongy bleeding gums old sores skin affections tonsillitis pharyngitis most common throat infections for relieving soreness and preventing infection Bowman's Laxative Pills were merely a combination of plant laxatives including aloe but bore broad claims for the restoration of health and the prevention of disease

#### INFORMATION FOR DOCTORS DURING THE OLYMPIAD IN BERLIN

It is likely that a large number of doctors will come to Berlin during the Olympic Games and will wish to use this opportunity of getting to know the various medical institutions and arrangements in Berlin. There has therefore been set up in the Kaiserin Friedrich Haus Berlin N W 7, Robert Koch Platz 7 an information bureau which will be able to give doctors every kind of information before and after as well as during the Olympic Games. The office is semi-official and gives advice impartially and free of charge. It would be to the advantage of every doctor to get in touch before or after his arrival in Berlin with the Kaiserin Friedrich Haus so as to save time and make the most of his stay.

A series of lectures 'Medical Theory and Practice in the New Germany,' will take place during the period of the Olympic Games on August 7 12 and 14 at 8 p m, in the Kaiserin Friedrich Haus.

Apart from the Reich Leader of the German physicians Dr Wagner of Munich the following will speak: Stellvertreter des Reichsärztesführers Dr Bartels Professor Dr v Bergmann Beauftragter für das ärztliche Fortbildungswesen Dr Blome Professor Dr Butenandt Danzig Staatsrat Dr Conti Professor Dr Grote-Dresden, Staatsrat Professor Dr Sanerbruch.

Entrance to these lectures is free of charge but a ticket must be shown, and this can be obtained from the Kaiserin Friedrich Haus Berlin N W - Robert Koch Platz 7.

#### DEATHS FROM LIGHTNING

The danger of being killed by lightning in the United States is very slight. About three persons in every million of the population have been thus struck down annually in the last ten years. During the period 1924-1933 there were recorded 3849 deaths within the expanding Death Registration Area of the United States or the equivalent of 365 per annum.

The frequency of thunderstorms is determined by climatic factors although the lightning hazard varies with the conditions of exposure. In a city like New York with many tall buildings built on a solidly connected steel skeleton almost complete protection from death by lightning is afforded not only to the persons within such buildings but also to those in the vicinity. These tall buildings act as most efficient lightning conductors partly by dissipating the electric tension without any actual lightning

discharge and partly by receiving the lightning discharge when it does occur and passing it harmless to the ground.

The relative frequency of deaths by lightning is the resultant of the frequency of thunderstorms in the respective areas and the conditions of life of the inhabitants. Those who are forced to spend some of their working hours in the fields may sometimes be unable to avoid exposure in a place where they form an outstanding target for the electric discharge. On the whole, city dwellers are probably safer than the traveler on the open road the worker in the field or the rider on the plains.

While these secondary factors undoubtedly do enter climatic conditions are the main determinant. There is a continuous band of States including Montana Wyoming Colorado, New Mexico and Arizona running from north to south characterized by annual death rates of six per million and over another continuous patch of States with these high rates is found in the southeast corner of the United States including South Carolina Georgia Florida, Alabama Mississippi Louisiana and Arkansas. States bordering on these areas also had in most cases higher than average death rates from this cause.

In contrast the Pacific Coast States and the highly industrialized States of New England and the Middle Atlantic Division ranked as the least hazardous parts of the country as regards fatalities from lightning. Outstanding among the States with low rates may be mentioned California with a population of approximately six million where there have been only five deaths from lightning in a ten year period studied and the State of Washington with a population of approximately a million and a half and only eight deaths in the same period.

Are deaths from lightning stroke to be classed as preventable? Certainly the risk can be much reduced by the exercise of common sense. Since almost any upright object projecting from the ground is a better conductor of electricity than air the tallest object in a landscape tends to be the natural target for the lightning stroke. Isolated buildings, trees or even single individuals on a plain or on a rising piece of ground may serve as conductors for the discharge. In a storm therefore it is an obvious precaution to avoid being near or forming part of such a target. Beyond that there is little cause for worry since the chance of being struck in the course of the year is measured by a few units in a million—Abstracted from *Statistical Bulletin*, Metropolitan Life Insurance Company 17 2 (June) 1936.

#### APPOINTMENTS OF MEMBERS OF THE MASSACHUSETTS BOARD OF REGISTRATION IN MEDICINE

Under suspension of the rules the Council recently approved the nomination of Dr Royal Phillips Watkins of Worcester to fill the unexpired term of Dr Charles P Sylvester who resigned because of ill health. Dr Sylvester was first appointed to the

Board by former Governor Fuller, and has served as Chairman. His administration has been noteworthy because of loyalty to the Commonwealth and the traditions of medicine.

Dr. Watkins, whose term expired this year, was first appointed in 1922 and has given valuable service to the State. Before Dr. Watkins' reappointment to succeed Dr. Sylvester, Dr. Harry L. Stevens of New Bedford was appointed to succeed Dr. Watkins.

The work of this Board imposes a severe tax on the time and strength of its members, and requires the exercise of judicial minds. The remuneration is inadequate. This means that these physicians, all active practitioners, are rendering a service involving the sacrifice of their financial interests. This willing spirit is characteristic of the profession.

We await the announcement of the selection of the Chairman. Dr. Rushmore continues as Secretary and General Executive of the Board.

### MASSACHUSETTS BOARD OF REGISTRATION IN MEDICINE

#### SUMMARY OF JULY, 1936 EXAMINATION

##### Total — 263

	Approved Schools	Non Approved Schools	
Repeated (3 or less)	15	57	72
Repeated (4 or more)	3	39	42
First time	90	59	149
	<hr/> 108	<hr/> 155	<hr/> 263

#### NEW APPLICANTS (1ST TIME)

##### Approved Schools

Berlin	3
Vanderbilt	1
Vienna	1
Columbia	2
Georgetown	1
Tufts	16
Virginia	1
Jefferson	3
Boston University	7
Harvard	18
Paris	2
Rush	4
Indiana	1
Washington	1
Baylor	1
Wisconsin	1
Frelburg	1
Johns Hopkins	3
Yale	1
Michigan	4
McGill	4
Women's Medical	2
Temple	2
Nebraska	1
New York University	1
Rome	1

Long Island	1
Duke	1
Hahnemann	1
George Washington	1
London	1
Rochester	1
Toronto	1
	<hr/> 90

##### Non Approved Schools

Philadelphia College of Osteopathy	10
Kirkville College of Osteopathy	4
Middlesex	29
Chicago Medical	5
Chicago College of Osteopathy	1
Physicians and Surgeons (Boston)	5
Massachusetts College of Osteopathy	4
Kansas City University	1
	<hr/> 59

##### REPEATERS (3 OR LESS)

##### Approved Schools

Rome	1
Boston University	1
University of Maryland	1
Tufts	7
Harvard	1
Berlin	1
Liege	1
London	1
Georgetown	1
	<hr/> 15

##### Non Approved Schools

Kansas City University	13
Middlesex	35
Massachusetts College of Osteopathy	2
MidWest	3
Kirkville College of Osteopathy	4
	<hr/> 57

##### REPEATERS (4 OR MORE)

##### Approved Schools

Athens	1
Laval	1
St. Louis University	1
	<hr/> 3

##### Non Approved Schools

Missouri	1
Massachusetts College of Osteopathy	7
Kansas City University	6
MidWest	4
Physicians and Surgeons (Boston)	7
Middlesex	8
Kirkville College of Osteopathy	3
Philadelphia College of Osteopathy	2
Physicians and Surgeons (St. Louis)	1
	<hr/> 39

## LAW PURSUES FEEBLE GERMICIDES AND "HEALTH SPRAY THAT FAILED

Disinfectants predominate in the list of prosecutions terminated during the past month under the Federal Insecticide Act, the Food and Drug Administration reports. Ineffective disinfectants are not only economic cheats but real health hazards enforcing officials declare. All defendants pleaded guilty.

James A. Haines trading as the Haines Products Company, Carey, Ohio, was fined \$50 and costs total \$70.50 for shipping in interstate commerce "H. & D. Health Spray," a product misbranded and adulterated under the provisions of the Insecticide Act. The Health Spray contained 94 per cent of water (a fact which was not mentioned on the label) and less of the active constituents than claimed. It was recommended as a disinfectant and germ destroyer for use by morticians, doctors, hospitals, homes, hotels, schools, state institutions, office buildings, beauty parlors, dry cleaners, steamship, cab, bus and railroad companies.

It was further recommended for preventing the spread of colds, influenza and other contagious diseases to purify the air, to banish all odors, destroy moths and drive out insects. The preparation was ineffective either as a germicide, disinfectant, or antiseptic, would not purify the air, banish odor, destroy moths or drive out all insects, nor would it maintain or improve health as the name would imply.

The American Pharmaceutical Company, a New Jersey corporation doing business in New York City, was fined \$100 for shipping misbranded and adulterated Solution Cresol Compound U.S.P., which failed to meet the requirements of the United States Pharmacopoeia.

### THREE MISBRANDED PRODUCTS

A prosecution against Spratt's Patent Ltd., New York, N. Y., resulting in a fine of \$150, involved three misbranded products: Spratt's Germicide, Spratt's Antiseptic Germicidal Flea Soap, and Spratt's Flea and Insect Powder. The last named preparation being also adulterated. The germicide contained inert substances, the label failing to bear the declaration of ingredients required by the Federal Insecticide Act.

The labeling also bore a number of false and misleading claims.

As the result of an action brought in the Federal Court at Trenton, N. J., a fine of \$575 was imposed on the Interstate Chemical Manufacturing Company of Jersey City, N. J., for shipping short measure lime sulphur solution. The court suspended \$500 of the fine, the remaining \$75 to be paid in cash. The company was put on probation for six months with the stipulation that a report be made at the end of each month to the New York Station of the Food and Drug Administration to the effect that an investigation had been made of formulas, labels and

batch cards to determine that the products manufactured were in compliance with law.

### CAUSTIC POISON ACT

A case brought in the Federal Court for the Southern District of New York against Merck & Company, Rahway, N. J. and New York, N. Y. for violation of the Federal Caustic Poison Act, resulted in a fine of \$25.00. The action involved Creolin Pearson, a product containing over five per cent of carbolic acid and the labeling failing to state the word "Poison," suitable treatment for use in case of accidental personal injury and the common name of the dangerous caustic or corrosive substance contained in the product.—U. S. Department of Agriculture.

### TO STUDY CAUSES OF HAY FEVER AND OTHER ALLERGIC DISEASES

A chemical study of substances in agricultural products and by-products that contribute to the allergic disturbances—hay fever, asthma, hives and related afflictions—is being established in the Bureau of Chemistry and Soils of the U. S. Department of Agriculture. Dr. W. W. Skinner, assistant chief of the bureau, announced July 1, 1936.

One-tenth of the population of the country suffer seasonal distress or continual discomfort and restricted activity as the result of allergic diseases known by such familiar names as hay fever, pollen fever, rose fever, colds, asthma, hives and so on. These afflictions affect people of all ages. Some individuals suffer from abnormal sensitiveness to certain normal constituents of the pollens produced by many varieties of trees, grasses and weeds. Similar substances present in common foods, textile fibers, furs and other farm products are also capable of causing distressing disturbances when absorbed through the skin or the membranes of the respiratory or digestive system of hypersensitive persons. Chemists and specialists in other lines of scientific investigation will attempt to isolate these offending components and to determine their composition.

Dr. Henry Stevens, biochemist of the Protein and Nutrition Division of the Bureau of Chemistry and Soils, is organizing the staff which will undertake the allergen investigations. Dr. Harry S. Bernton, Professor of Hygiene at the Georgetown University Medical School, has been appointed consulting specialist in allergy and will participate in the department studies of the allergens.

Funds for this investigation provided by the Bankhead Jones Act, signed by the President a year ago, will enable the Federal Department of Agriculture and State agencies to proceed with long-deferred researches of fundamental significance to agricultural science. The chemical study of the allergens is one of several studies made possible under the provisions of this Act.—U. S. Department of Agriculture.

## CORRESPONDENCE

## THE DANGER OF USING RAW MILK

Editor, *New England Journal of Medicine*,

The editorial "More Evidence in Favor of Pasteurization" in the July 2 issue of *The New England Journal of Medicine* has my hearty endorsement. We need more publicity on that subject. With all the articles which have been written in regard to the danger of using raw milk, there are yet some physicians who use raw milk in their homes and advise their patients to use it in preference to that which has been made safe by pasteurization. It is difficult to understand this attitude and it emphasizes the need of further discussion of the subject.

Some of the hazards facing the users of raw milk are as follows:

Although Massachusetts has been placed on the list of modified accredited States as a result of the bovine tuberculosis eradication program, the disease still exists in a small percentage of the dairy cows, and raw milk from such cows may produce serious disease in young children, especially infants.

*Brucella* infection (Bang's disease), which is found in a large percentage of the dairy herds of the State, may transmit the infection through milk and produce undulant fever in man. The disease is recognized with greater frequency each year. Forty-two cases were reported in 1935 and over twenty cases so far this year.

Cows with mastitis due to hemolytic streptococci may pass the infection on to human beings and cause septic sore throat, scarlet fever, and erysipelas. All three of these diseases have been found in a single milk borne outbreak.

The milk handler may be a typhoid carrier and infect the milk.

These milk borne infections may be guarded against only by the use of properly pasteurized milk.

It is gratifying to record that an increasing number of boards of health are recognizing the potential danger of raw milk and have passed ordinances requiring that all milk sold be pasteurized or certified. The following thirty communities, with a total population of 2,068,709, are enforcing such ordinances:

Ayer	Natick
Beverly	New Bedford
Boston	Newton
Braintree	Norwood
Brookline	Quincy
Cambridge	Revere
Chelsea	Salem
Dedham	Somerville
Everett	Stoneham
Fall River	Swampscott
Framingham	Waltham
Lexington	Watertown
Lowell	Wellesley
Malden	Winchester
Milton	Winthrop

Nearly one-half of the population of the State is thus protected. Progress has been slow in the past but acceptance of this method of protection will be more rapid in the future.

Much research has been done and many articles have been published which show that pasteurization does not change the quality of the milk or lessen its nutritive value. It is another safeguard that protects the health of the public.

Physicians, by advice to their patients, can do much to hasten the day when pasteurization of all milk sold will be accepted as a routine procedure.

Yours truly

HENRY D CHADWICK, M.D.,  
*Massachusetts Commissioner of Public Health*

## RECENT DEATHS

**BAKER**—HARRY BEECHER BAKER, M.D., of 59 Main Street, Taunton, Massachusetts died June 7, 1936.

Dr. Baker was born in New Bedford, June 18, 1858, the son of Samuel Wells Baker and Mary J. (Brownell) Baker. His early education was acquired at the Friends Academy and the New Bedford High School. His M.D. degree was conferred by the Jefferson Medical College in 1880.

Dr. Baker first settled in Dighton where he practiced for thirty years, subsequently moving to Taunton. He had served as assistant at the Carney Hospital Eye Clinic for some time following 1896 and had held the position of censor of his district medical society and had been a member of the Dighton Board of Health and secretary of the Dighton School Board.

He was a Fellow of the Massachusetts Medical Society and the American Medical Association retiring from the former Society in 1934.

Dr. Baker had held membership in the United States Marine Hospital Service, St. John's Commandery, Knights Templars of Providence, Aieppo Temple of Boston and the Odd Fellows.

He was consultant to the Morton Hospital and the Taunton State Hospital. Dr. Baker married Nellie Cook Lincoln who died several years ago. He is survived by two daughters, Mrs. Mabel L. Hammett of Taunton and Mrs. Natalie B. Shaw, of Riverside, R. I. There are six grandchildren.

**JEWETT**—FRED BRICE JEWETT, M.D., Superintendent of the Reeves Sanatorium of Melrose, Mass. died July 26, 1936 following a brief illness. Dr. Jewett was born in Winsted, Conn., in 1866. He graduated from Amherst College in 1888 and from the Harvard University Medical School in 1892. He had served in the Massachusetts State Hospitals in Danvers and Taunton and State Hospitals in Rhode Island before serving as Superintendent of the Reeves Sanatorium.

Dr. Jewett joined the Massachusetts Medical Society in 1896 and resigned in 1899.

His widow, Mrs. Caroline (Maloon) Jewett, two sons, Harold, of Cranston, R. I. and Raymond, of Melrose and two half sisters survive him.



## REPORTS AND NOTICES OF MEETINGS

### NEW ENGLAND HEART ASSOCIATION

The monthly clinical meeting of the New England Heart Association was held at the Children's Hospital on May 25 1936 at 4 30 p m The first paper on the program was the report of a case by Dr Harry F Dietrich of An Identical Twin with a Bicuspid Pulmonary Valve Although recent interest has brought forward a surprisingly large number of reports of various pathologic states occurring in twins records of cardiac anomalies are scarce In his two reviews of the pathology in twins Stransky records none Smith abstracted two previous reports in one, both twins had complete transposition of all viscera and in the second pair only one twin showed situs inversus The latter twins however had mirror image harelips To these instances Smith added observations on twins each of whom had cyanotic attacks and a widely patent ductus arteriosus There are probably other cases hidden in the reports of Mongolian idiocty in twins, for Lund's cases have apical systolic murmurs and Rosanoff and Hardy saw one of their sets of twins 'Each had a cardiac lesion

Dr Dietrich's report concerned identical twins one of whom came to necropsy and showed an anomaly of the pulmonary valve Nineteen month old twin sisters, who had been on uncomplemented milk diets were brought to the Infants Hospital with histories of fever vomiting and diarrhea on two and four days duration respectively Through out their illnesses there was an almost absolute parallelism of signs, symptoms and physical and laboratory findings Briefly, each child showed marked secondary anemia and signs of dehydration and acidosis and x-rays revealed similar changes in growth of the long bones Shortly after admission evidence of a colon bacillus pyelonephritis was found and a few days later central nervous system irritation with spinal fluid containing red cells, and increased pressure and increased protein suggested that both had developed a cerebral sinus or venous thrombosis One of the children died fourteen days after the appearance of cerebral symptoms and the autopsy showed acute pyelonephritis a unilateral bifid ureter cerebral sinus thrombosis with subjacent hemorrhage and a bicuspid pulmonary valve The living patient showed gradual improvement and recession of the cerebral signs and the abnormal urinary findings An intravenous pyelogram failed to define any renal anomaly However with the startling similarity in the illnesses of these two children it seems reasonable to presume that this patient also has the renal and cardiac anomalies that were found in her sister Prior to the reparation of her severe anemia this patient had an enlarged heart and a blowing systolic murmur at present both of these findings have disappeared and the supposition that this living child has a cardiac anomaly is based solely on the pathol-

ogy found in her twin sister and the conviction that these are monozygotic twins

Dr Mark I Mahler presented two cases of so called idiopathic hypertrophy of the heart with recovery Massive cardiac hypertrophy in infancy and childhood unexplained on any clinical or anatomic basis is commonly described under the classification of Congenital Idiopathic Hypertrophy of the Heart Many case reports have been published under this heading presenting similar clinical syndromes but with varied pathological findings Confusion as to its exact microscopic pathology has therefore resulted These different pathological pictures of presumably the same syndrome may be the result of errors in its diagnosis or variations of the disease, more likely the former It is quite evident from a study of these cases that the term Congenital Idiopathic Hypertrophy of the Heart is inadequate and misleading Perhaps when more is known of its etiology and pathogenesis a more descriptive term may be offered

Its essential pathology in the main consists of a marked hypertrophy of the heart often three or four times its normal weight with no known intrinsic or extrinsic cause There is notable absence of congenital anomalies of the valves, septa great vessels and chambers of the heart or of lesions elsewhere in the body which might be expected to lead to myocardial hypertrophy Microscopically the heart shows a hypertrophy of the cardiac muscle fibers with slight replacement fibrosis in a few cases and myocardial degeneration vacuolization some fibrosis with occasional round cell infiltration in others Perivascular fibrosis of the coronary arteries has been stressed by Kugel and Stoloff as a characteristic finding

True idiopathic hypertrophy of the heart is of somewhat rare occurrence To date less than fifty authentic cases have been reported Only five case records with autopsy protocols of this syndrome appear in the files of the Children's Hospital for the past twenty years

Many theories have been advanced as to its etiology A true fault in the germ plasma has been suggested by Sprague, Bland and White Other authors feel that this group bears some relationship to the so-called status thymicolymphaticus A few have stressed a toxic or infectious origin A metabolic disturbance comparable with a von Gierke syndrome should also be mentioned Its common association with rickets tends to suggest the possibility of a vitamin deficiency disease Abnormal origin of the coronary arteries has also been put forth as a possible cause

The onset usually occurs suddenly in a previously well infant although in a few instances rapid respiration and dyspnea have been noted from birth The infant becomes irritable and refuses food Labored breathing soon appears Cough tachycardia increasing dyspnea and cyanosis manifesting a failing heart muscle usually follow Fever appears with the advent of pneumonic involvement

The course is rapid and death follows, in a few days, from cardiac failure.

If cardiac enlargement is not found by physical examination, as often happens in infants, x-ray of the chest will reveal a tremendously enlarged heart shadow. The pericardium may be prominent. The pulse is rapid and murmurs are inconstant or absent. The disease manifests itself generally within the first two years of life. A few cases have been reported occurring later in childhood.

That this disease is not entirely fatal is evidenced by reports of several writers. Gaultier and Schoenau<sup>1</sup> reported a cure in a two-month-old infant under digitalis therapy. Finkelstein also noted a recovery in one case. In the cases of Lereboullet and Chabrun<sup>2</sup>, improvement was noticed under digitalis.

Two cases of this syndrome with recovery were reported. These cases fit in clinically and roentgenologically with those already described but whether these are true cases of so-called idiopathic hypertrophy cannot, of course, be definitely decided in the absence of postmortem findings.

The first case was that of an eleven-month-old female infant who was admitted to the hospital because of failure to gain in weight and slight cough of a few days duration. Examination showed an ill-looking infant. The left chest was more prominent than the right. The heart rate was 120 and no murmur present. X-ray showed a tremendous spherical enlargement of the cardiac silhouette. Her respiration became dyspneic. She was then digitalized with digifoline and there followed a marked improvement in her general condition. Observation over a period of seven years showed a decrease in her pulse rate and her heart has returned to its normal size and shape. She is enjoying good health at the present time.

The second case was a male infant of three months who was dyspneic and underweight. The heart was markedly enlarged and the left border extended to the axillary line. The pulse rate was 130 and no murmurs were heard. X-ray revealed an enormous heart occupying nearly the entire left chest. The electrocardiogram showed a sinoauricular tachycardia. He was observed for a period of three years and his heart has now returned to its normal size and rate.

Dr. Hyman Green spoke on Arachnodactylia, which was first described by Marfan in 1896. Achard in 1902 gave it its present name. Since then about eighty cases have been described. In 1926 Piper and Irvine Jones wrote the first paper in American literature on its association with congenital heart disease. The majority of cases described concern children or adolescents.

The characteristic features of this condition are abnormally long thin fingers and toes. The head is dolichocephalic. The eye findings are distinctive, showing deep anterior chambers, subluxation of the lens and tremulousness of the iris. The ears

show general enlargement of the lobes. Congenital heart disease is usually associated with this condition. The liability to pneumonia is great as the bony thorax is so frequently deformed. Deformities of the chest, kyphosis and scoliosis are found. There is poor musculature and absence of subcutaneous fat. Patients are underweight and usually tall. Mental condition is normal. X-ray of the sella turcica is normal. Tuberculin and Wassermann normal. The first symptoms are fatigability and poor vision. The etiology is obscure. The condition has been considered a congenital mesodermal defect, hereditary (four cases have been reported in one family), and an exhaustion product. Hyperpituitarism has been blamed also. There is no evidence of abnormality of the ductless glands.

Two cases of this rare disease were reported first: a girl of seven years with typical eye findings, dislocation of the lens, tremulous iris, and congenital heart with long fingers and toes, secondly a boy of sixteen with the same findings plus a deformity of the chest. In each case the symptoms were the same. They each went to the orthopedic department for pain in the feet and relief of fatigue. Later the vision was noted as poor.

Dr. L. A. Vance reported a case of Dr. Henry F. Keever's which presented a difficult problem in diagnosis. The case was that of a nine-year-old American schoolboy who entered the Newton Hospital because of increasing fatigue and breathlessness. There was considerable variation in the interpretation of the clinical picture and physical findings by several cardiologists. Outstanding symptoms, aside from a transitory pulmonary infection which precipitated his hospital entry, were breathlessness and fatigue coupled with pounding of the heart on moderate exercise. Physical examination showed a bulging precordium, forceful diffuse apex beat, systolic thrill, diastolic and systolic murmurs, increased mediastinal dullness, where no change from the normal was found five years ago, aside from cardiac enlargement and a faint systolic murmur. Laboratory work was negative. Hinton and Kahn negative. Electrocardiogram showed notching of the QRS complex in the third lead. X-rays showed an expansile mediastinal mass appearing to be continuous with the heart below and the aorta above. Death came suddenly while sleeping, three months after discharge. Autopsy revealed a thymus which weighed 125 grams, and a large fusiform aneurysm of the ascending aorta which appeared inflammatory in origin, closely resembling the picture seen in syphilitic aortitis. No spirochetes were found in the aortic wall. There was no endocarditis.

Dr. Bronson Crothers spoke on Behavior Difficulties in Children who have attended Heart Clinics. He pointed out that everyone who undertakes to deal with children who have symptoms of heart disease knows that the emotional difficulties may be formidable. Some of the difficulties are unquestionably unavoidable since many of these children need rest and will not survive without it. There

is, however one group of children who come to the notice of neurologists and psychiatrists with extraordinary frequency, i.e., the group of so-called potential heart disease. It is the exception rather than the rule that the parents have a clear understanding of the limitations within which they must work. In most cases no adequate attempt is made to organize the activity of the child in a constructive way. All the difficulties probably arise from a difference of emphasis in giving advice and it is quite probable that the general run of these children are unharmed by contact with heart clinics. It was Dr Crothers feeling however, that a certain number of children who are routinely restricted merely because of suspected heart disease may rebel and in so doing develop abnormalities of behavior that are more serious than the cardiac complications which it is desired to prevent.

Dr Paul W. Emerson presented a Short Study of a Group of Cases Showing Transposition of the Great Vessels. Cases with crossed transposition of the great vessels of the heart present a confusing picture on entry to the hospital because they may have on the one hand, congenital heart malformation, or some other condition and on the other hand congenital heart malformation and some other condition that condition being often an infection or malformation interfering with the function of the upper air passages, the intestine or the central nervous system. The outstanding feature of a group of thirteen cases of transposition of the great vessels seen in the Infants Hospital in the past twenty years was their extraordinarily small cardiac reserve. These babies are cold, have a feeble cry, tend to have a high red count and are subject to spells of acute circulatory distress. They are much retarded in growth, weight and length. Flat on their backs, with no physical demands made upon them except to breathe, nurse and defecate, they show dyspnea from birth, become cyanotic easily and at times show edema, which is more true of this type of malformation than of any other. They live commonly to the age of two and one-half or three months, have a short final illness, often only three or four days, and die within twenty-four hours after reaching the hospital. In a baby under three months of age, dyspnea, cyanosis, spells of acute circulatory distress and edema point more to transposition of the great vessels than to any other cardiac anomaly.

Dr M. A. Kugel of New York was scheduled to give the last paper of the afternoon but was unfortunately prevented by illness. He however sent a brief abstract which is as follows: A Definite Clinical Syndrome Associated with Enlargement of the Heart in Infants and Young Children. Congenital idiopathic hypertrophy is a term long used designating an enlargement of the heart with no apparent cause. This term is not only inappropriate and meaningless but unfortunately has been further confused by the inclusion under its name of many types of cardiac enlargement. It is the author's

opinion that careful search or consideration would reveal the cause of the enlargement.

Eight cases which might have been considered as congenital idiopathic hypertrophy are described because they present a definite clinical syndrome which can be differentiated from von Gierke's disease and other conditions with cardiac enlargement. This syndrome of infants and young children is characterized, clinically, by abnormal enlargement of the heart, afebrile course, abnormal electrocardiogram, tendency to abrupt onset of myocardial failure in an apparently previously well child, and the unexpected suddenness with which death may occur.

Pathologically, all cases present similar lesions: primary degeneration of muscle fibers, atrophy of the muscle fibers with fatty infiltration, replacement fibrosis with no evidence of suppurative foci or other cells. The coronary arteries show perivascular fibrosis, hypertrophy of the media and at times proliferation of the intima, which is sufficient to obliterate the lumen.

Two similar cases have been observed in adults.

#### REFERENCES

1. Gautier P. and Schoenau M. L'hypertrophie cardiaque primitive chez le nourrisson. *Rev. méd. de la Suisse Rom.* 51:635 (Sept. 25) 1931.
2. Lereboullet, P. and Chabrun J. Fractures multiples chez les nourrissons rachitiques. *Bull. Soc. de pédiat. de Paris* 29:151 (March) 1931.

#### TWELFTH CLINICAL CONGRESS OF THE CONNECTICUT STATE MEDICAL SOCIETY.

NEW HAVEN, SEPTEMBER 22, 23, 24, 1936

The registration fee for the 1936 Clinical Congress will be \$2.00. Luncheons are not included in this fee.

At the afternoon sessions there will be bedside clinics given by the speakers of the morning to be followed by panel discussions on the subjects that have been presented at the morning sessions. Members of the Congress will have the opportunity to present questions to be considered in these discussions.

The programs for the evening sessions have been arranged by the various sections. Members of the Congress have the privilege of attending any of these.

All papers presented before the Congress will be abstracted in the October issue of the Quarterly Bulletin of the Connecticut State Medical Society.

The Women's Medical Society of Connecticut will hold its fall luncheon meeting at the time of the Clinical Congress. All medical women will be welcome. Further details will appear in the final program.

Parking of automobiles for members of the Congress will be restricted as to time in the vicinity of the meeting place. Continuous telephone service will be maintained. Members can be reached at any time by calling New Haven 51161. Clinical Congress extension.

There doubtless are many physicians outside of the state of Connecticut who would be interested in

the Clinical Congress. Announcements will be sent to them if their names and addresses are received.

Early registration will facilitate the work of the committee. Names of all who register before August 25 will be published in the final program to be distributed about September 1.

MAURICE J. STRAUSS, M.D.,

*Chairman of the Committee on Publicity  
and Registration*

41 Trumbull Street New Haven Conn

### PROGRAM

TUESDAY, SEPTEMBER 22

All Times Given Are Daylight Saving Time

9 30 a m

Auditorium, Sterling Law Buildings

Dr S Bayne Jones Presiding

Our Duty to the Fracture Patient

Dr Frederic W Bancroft Associate Professor of  
Clinical Surgery, Columbia University, Attending  
Surgeon, City Hospital, New York

The Etiology, Treatment and End Results of Gastro-Duodenal Ulcer

Dr Burrill B Crohn New York

What the General Practitioner Should Know About Neurology

Dr Foster Kennedy Professor of Neurology, Cornell University Medical College, Director of  
Neurological Department, Bellevue Hospital,  
New York

Pollomyelitis

Dr Thomas M Rivers Member of the Rockefeller  
Institute for Medical Research, New York

2 15 p m

New Haven Hospital

*Bedside Clinics*

Case of Essential Hypertension

Dr Bancroft.

Case of Colitis

Dr Crohn

Case of Encephalitis

Dr Kennedy

3 00 p m

New Haven Hospital

*Panel Discussions*

Symposium on Treatment of Fractures

Dr Carl W Henze, Chairman

Symposium on Peptic Ulcer

Dr Robert F Scholl Chairman

Symposium on Neurology

Dr Otto G Wiedman Chairman

Symposium on Pollomyelitis

Dr Alfred Labensky, Chairman

8 15 p m

New Haven Hospital

Section on Eye, Ear, Nose and Throat

Dr Perry G Goldsmith Toronto Acute and

Chronic Upper Respiratory Inflammation A  
Clinical Lecture from Water-Color Drawings on  
Lantern Slides

Section of Neurology and Psychiatry

Dr Abraham Myerson, Boston The Neuroses

The Hezekiah Beardsley Pediatric Club

Dr Louis K Diamond, Boston The Role of Iron  
in the Nutrition of the Young

Cardiology

Dr Howard B Sprague Boston The Progress of  
Cardiology During 1935-1936

WEDNESDAY, SEPTEMBER 23

9 30 a m

Auditorium, Sterling Law Buildings

Dr Daniel C Patterson, Presiding

Recent Advances in the Diagnosis and Treatment of  
Peripheral Vascular Diseases

Dr Louis G Herrmann Assistant Professor of  
Surgery, University of Cincinnati, Director of  
the Vascular Disease Clinics of the Cincinnati  
General Hospital and the Christian R Holmes  
Hospital of the University of Cincinnati

Injuries of the Bones and Soft Tissues of the Face

Dr Vilray B Blair, Professor of Clinical Surgery,  
Washington University School of Medicine,  
St Louis

Recent Advances in the Study of Food Allergy

Dr Warren T Vaughan, Richmond

The Clinical Manifestations of Ectopic Gestation

Dr Walter T Dannreuther Professor of Clinical  
Gynecology, New York Post Graduate Medical  
School

2 15 p m

New Haven Hospital

*Bedside Clinics*

Case of Raynaud's Disease

Dr Herrmann

Case of Cancer of the Mouth

Dr Blair

Case of Migraine

Dr Vaughan

Case of Fibroid Tumors of the Uterus

Dr Dannreuther

3 00 p m

New Haven Hospital

*Panel Discussions*

Symposium on Peripheral Vascular Disease

Dr Ashley W Oughterson, Chairman

Symposium on Injuries to the Bones and Soft Tissues of the Face

Dr William F Verdt Chairman

Symposium on Food Allergy

Dr Howard S Colwell Chairman

Symposium on Gynecology

Dr Luther Musselman Chairman

8 15 p m

New Haven Hospital

Section on Radiology

Dr Richard Dresser Boston The Radiological  
Management of Cancer of the Breast

Section on Dermatology and Syphilology

Dr Marlon B Sulzberger, New York Recent De-  
velopments in the Diagnosis and Treatment of  
Diseases of the Skin

Section on Obstetrics and Gynecology

Dr Emerson L Stone New Haven Motion Pic-  
tures

THURSDAY, SEPTEMBER 24

9 30 a m

Auditorium Sterling Law Buildings

Dr Daniel Sullivan Presiding

The Practicing Physician and the Diagnosis and  
Treatment of Occupational Diseases

Dr Leonard Greenburg Executive Director Divi-  
sion of Industrial Hygiene New York State De-  
partment of Labor

Salient Experiences in Thirty Years Contagious  
Disease Practice

Dr Edwin H Place Physician in Chief South De-  
partment Boston City Hospital

Endocrinology of Today Panel Discussion

Chairman Dr Roy G Hoskins Director of Re-  
search Memorial Foundation for Neuro-Endo-  
crine Research Boston

Dr Fuller Albright, Associate in Medicine Har-  
vard Medical School Boston

Dr Edgar Allen, Professor of Anatomy Yale Uni-  
versity School of Medicine New Haven

Dr Earl Engle Professor of Anatomy College of  
Physicians and Surgeons, Columbia University  
New York.

Dr Max A. Goldzieher Endocrinologist Gou-  
verneur Hospital, New York.

Dr Raphael Kurzrok, Associate in Gynecology  
and Obstetrics College of Physicians, Columbia  
University, New York.

Dr Elmer L Sevringhaus, Associate Professor of  
Medicine University of Wisconsin Madison  
Wisconsin

2 15 p m

New Haven Hospital

Bedside Clinics

Case of Silicosis

Dr Greenburg

Endocrinology

Case of Parathyroid Disease

Dr Albright

Case of Pituitary Obesity

Dr Goldzieher

Case of Primary Amenorrhea

Dr Kurzrok

Case of Diabetes

Dr Sevringhaus

3 00 p m

New Haven Hospital

Panel Discussions

Symposium on Industrial Diseases

Dr Arthur B Davton Chairman

Symposium on Immunity Procedures in Acute In-  
fections

Dr Joseph I Linde, Chairman

OFFICERS

Stanhope Bayne Jones Chairman

Herbert Thoms Secretary

Charles E Sanford Treasurer

Daniel C Patterson President of the Society

J Douglas Gold Chairman of the Council

Creighton Barker, Administrative Secretary  
of the Society

Charles W Comfort Jr, Legislative Secretary  
of the Society

Stanley B Weld Secretary on Scientific Work.

MIDDLESEX SOUTH DISTRICT MEDICAL  
SOCIETY

The Mid Summer Meeting will be held at the Oak-  
ley Country Club, Belmont on Wednesday August  
5 1936

PROGRAM

Luncheon. 12 noon

There is no charge to paid up members for the  
luncheon Guest tickets may be obtained at \$1.25  
each from Dr Edward Mellus the Treasurer

Speaker

Deputy Commissioner Edward C R Bagley of  
the Massachusetts Department of Correction will  
speak on Crime Criminals and the Community  
His talk will be of considerable interest to the mem-  
bers of this Society since the medical and surgical  
aspects as well as the sociological angles will be dis-  
cussed by him

Golfers

Please make arrangements with Mr Harry An-  
drews telephone Belmont 2400 The greens fee is  
\$1.50

This meeting is being held jointly with the Mid-  
dlesex South District Medical Society Golf Associa-  
tion

SUMNER H REMICK M.D., President

ALEXANDER A LEVI, M.D., Secretary

SOCIETY MEETINGS,  
CONGRESSES AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK  
BEGINNING MONDAY AUGUST 3 1936

Wednesday August 5—

112 m Clinico Pathological Conference Children's  
Hospital

Saturday, August 8—

\*10 a m - 12 m Staff Rounds at the Peter Bent Brigham Hospital Conducted by Dr Reginald Fitz

\*Open to the medical profession

†Open to Fellows of the Massachusetts Medical Society

August 24 29—Harvard University Tercentenary Celebration See page 1166 issue of June 4

September, 1936—First International Congress of Sanatoria and Private Nursing Homes See page 803 issue of April 16

September 7-10—International Union against Tuberculosis See page 654 issue of March 12

September 7 11—American Congress of Physical Therapy will meet at the Waldorf-Astoria New York City See page 62 issue of July 2

September 14 and 15—Tercentenary Session of the Harvard Medical School See page 1166, issue of June 4

September 22, 23, 24—Twelfth Clinical Congress of the Connecticut State Medical Society See page 217

October 12 18—Third International Congress on Malaria. See page 1076 issue of May 21

October 19 23—Clinical Congress of the American College of Surgeons See page 180 issue of January 23

October 19 31—1936 Graduate Fortnight of the New York Academy of Medicine See page 1221 issue of June 11

October 20 22—Academy of Physical Medicine Annual Meeting Hotel Statler Boston

October 20 23—The American Public Health Association See page 1226 issue of June 11

March 30 April 2, 1937—First International Conference on Fever Therapy Postponement notice See page 62 issue of July 2

April 21 24, 1937—American Society for Experimental Pathology See page 1075, issue of May 21

### DISTRICT MEDICAL SOCIETIES

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY  
August 5—See page 219

## BOOKS RECEIVED FOR REVIEW

Basal Metabolism in Health and Disease Eugene F Du Bois Third Edition Thoroughly Revised 494 pp Philadelphia Lea & Febiger \$5 00

Time of Ovulation in Women A Study on the Fertile Period in the Menstrual Cycle Carl G Hartman. 226 pp Baltimore The Williams & Wilkins Company \$3 00

Cardiac Output and Arterial Hypertension Sidney A Gladstone 56 pp \$1 00

A Study of Masturbation and the Psychosexual Life John F W Meagher Third Edition 149 pp Baltimore William Wood & Company \$2 00

Studies from The Rockefeller Institute for Medical Research Reprints Volume 97 621 pp New York The Rockefeller Institute for Medical Research

Endocrine Tumours and Other Essays Frederick Parkes Weber 207 pp London H K Lewis & Co, Ltd 7s 6d net

Medical History of Contraception Norman E Himes 521 pp Baltimore The Williams & Wilkins Company \$7 00

Röntgenographic Technique A Manual for Physicians, Students and Technicians Darmon Artelle Rhinehart Second Edition, Thoroughly Revised 431 pp Philadelphia Lea & Febiger \$5 50

The Balanced Diet Logan Clendenning 207 pp New York and London D Appleton Century Company \$1 50

Parenteral Therapy A Ready Reference Manual of Extra Oral Medication for Physicians, Dentists, Pharmacists, Chemists, Biologists, Nurses, Medical Students and Veterinarians. Walton Forest Dutton and George Burt Lake 386 pp Baltimore and Springfield Charles C Thomas \$7 50

The Surgical Clinics of North America Volume 16, Number 1 Chicago Number, February, 1936 356 pp Philadelphia and London W B Saunders Company

Allergy of the Nose and Paranasal Sinuses A Monograph on the Subject of Allergy as Related to Otolaryngology French K Hansel 820 pp St. Louis The C V Mosby Company

Emergency Surgery Hamilton Baller 842 pp Second Edition Baltimore William Wood & Company

The Harvey Lectures Delivered under the Auspices of the Harvey Society of New York 1934-1935 William B Castle, et al Series XXX. 270 pp Baltimore The Williams & Wilkins Company  
Surgical Emergencies in Children Harold Clifford Edwards 274 pp Baltimore William Wood & Company \$4 50

The Adrenals Arthur Grollman 410 pp Baltimore The Williams & Wilkins Company \$5 00

Handbook of Surgery Eric C Mekle 699 pp Baltimore William Wood & Company \$4 50

The Normal Diet and Healthful Living W D Sansum, R. A Hare and Ruth Bowden 243 pp New York The Macmillan Company \$2 00

Clinical Heart Disease Samuel A Levine 445 pp Philadelphia and London W B Saunders Company \$5 50

Physical Therapy for Nurses. Richard Kovács 286 pp Philadelphia Lea & Febiger \$2 75

Interpretation of Laboratory Findings. Raymond H. Goodale 170 pp Philadelphia F A Davis Company \$2 25

One Hundred and Twenty Second Annual Report of the Trustees of the Massachusetts General Hospital 1935

Neurological Surgery Loyal Davis 429 pp Philadelphia Lea & Febiger \$6 00

Strength Out of Suffering France Pastorelli 223 pp Boston and New York Houghton Mifflin Company \$2 00

## BOOK REVIEWS

Diseases of Women Harry Sturgeon Crossen and Robert James Crossen Eighth Edition Entirely Revised and Reset 999 pp St Louis The C V Mosby Company \$10 00

The present generation of obstetricians and gynecologists in America has been brought up with Crossen's Diseases of Women as a volume essential not only for their libraries but valuable for ready reference The reviewer knows some Boston men who have the latest edition in their offices and the supplanted one in their homes because of its clarity and worth It is an exceptional occurrence when

an able father has an able son to carry on the tradition as in the production of the volume now under discussion.

Many pictures and the text referring to standardized methods of treatment and description of operations are found as old friends. The feature which makes this new edition of especial interest is the very careful revision and the addition of entirely new material, photographs and drawings.

The chapter on gynecological pathology is so clear and well presented that older practitioners as well as younger students should easily acquire the facts.

Discussion of endocrine disturbances and their effect on the development and function of the reproductive organs is ably presented and makes that difficult subject more easily understood. Note particularly Chart 56 which depicts in a graphic way the interrelations of the hormones.

The elder Crossen has been generous and wise in speaking of the radical operation for cancer of the cervix as an obsolete method and the remarks on radium and x-ray treatment for this disease are timely. The drawings showing the course of the rays should be helpful and it is wise that the radiation dosage is not discussed, for that is not yet absolutely standardized. No man can be a general practitioner successfully without the facts presented in this book, and no similar book seems to present them better. To the teacher of gynecology, the methods of presenting the advances in this specialty are worth reading. The student and general practitioner cannot own a better standard volume on this subject.

**The Chemistry of Natural Products Related to Phenanthrene.** An American Chemical Society Monograph. L. F. Fieser. 358 pp. New York: Reinhold Publishing Corporation. \$6.50.

A very important addition to the American Chemical Society monograph series is this volume 70 by Professor Fieser on the chemistry of natural products related to phenanthrene. Its contents have a double interest: first because the systematic treatment of this section of Organic Chemistry is nowhere better covered than in this volume and secondly because the sections on cancer-producing hydrocarbons, sterols and bile acids, sex hormones and heart poisons have their obvious application in the various medical sciences.

It should be stated at the outset that most practicing physicians have not a sufficiently technical chemical training to read this book in toto intelligently. It is replete with beautifully arranged chemical formulae of polycyclic compounds, which are absolutely essential to a comprehension of the subject matter but which would bewilder the average physician. For the medical scientist however or for physicians doing research along specialized lines the work will prove extremely valuable in several fields of laboratory investigation. The develop-

ment of the carcinogenic hydrocarbons is based in part on the author's own excellent original work and is for that reason particularly authoritative. Similarly, the discussion of the chemical behavior of sex hormones will prove valuable to the endocrinological investigator or to the pharmacologist.

After describing the fundamental chemistry of the phenanthrene and related coal-tar groups of hydrocarbons, the author discusses successive groups of natural products of interest in the applied sciences. Among these are the morphine group of alkaloids, the resin acids, cancer-producing hydrocarbons, sterols and bile acids, sex hormones, heart poisons and saponins. To the medically minded the following topics are among those which would appeal: morphine, apomorphine and drug addiction in relation to chemical structure; color reactions of cholesterol, irradiated ergosterol and vitamin D; oestrone and oestril; oestrogenic substances and cancer; preparation of androsterone from cholesterol; progesterone; strophanthidin; digitoxigenin; ouabain; scillardin.

Like most of the American Chemical Society monographs the typography is pleasing. There are excellent subject and author indices which allow easy access to the 337 pages of text. In addition, there are hundreds of references to original articles given in the footnotes which should prove indispensable to those engaged in intensive study of the various topics covered.

**On Percussion of the Chest. Being a Translation of Auenbrugger's Original Treatise.** John Forbes. 31 pp. Baltimore: The Johns Hopkins Press. 75c.

Auenbrugger's book on percussion is one of the great classics of medicine. Published in 1761 in Latin it represented seven years of clinical research by the author. Like all revolutionary ideas percussion was recognized at first by a few, but scoffed at by many. Even Viennese physicians took up the method slowly and half a century passed before clinical medicine was ready to adopt it. Another twenty-five years rolled along before the British or American physician received a translation into English (1824) and Auenbrugger's great work became widely known outside of Europe. The Englishman, John Forbes, made a good translation, worthy of reprinting. Dr. Henry E. Sigerist has written a brief introduction. Every medical student will appreciate this book and many physicians will welcome this splendid reprint.

**Interpretation of Laboratory Findings.** Raymond H. Goodale. 170 pp. Philadelphia: F. A. Davis Company. \$2.25.

With the multiplicity of laboratory tests a compact handbook that gives in very brief form laboratory data of frequent use is a welcome addition to the physician's library. The normal values of various constituents of the body fluids and the significance of variations in them are discussed. There is also a brief section on basal metabolism.



The second part of the book lists a group of diseases with the important laboratory findings associated with them

The third part discusses the physiologic pathology of the body fluids and excreta

The fourth part is devoted to brief directions for the preparation of material for laboratory examination

It is difficult to compact into 160 pages the essential points of laboratory procedures. Dr. Goodale has carried out this difficult task in commendable fashion

**The Commonwealth Fund Seventeenth Annual Report.** For the year ending September 30 1935 89 pp. New York: The Commonwealth Fund

The annual report of the Commonwealth Fund for 1935 accounts for the expenditure of \$1,574,025.07. Of this total, 58.3 per cent has been devoted to the promotion of health.

The activities of the Commonwealth Fund are well known here. The work at the House of the Good Samaritan in heart disease, the State-wide pneumonia service and studies of public health organization in the State have all been aided from the Commonwealth Fund.

The second part of the report, called "Sketches from the Field," covers first a week in a rural hospital and secondly, a description of experiments on renal function.

**Medical Papers Dedicated to Henry Asbury Christian, Physician and Teacher.** Editor, Robert T. Monroe. 1000 pp. Baltimore: Waverly Press, Inc.

This volume is an interesting compilation of medical papers affectionately assembled by a number of Dr. Christian's former house pupils at the Peter Bent Brigham Hospital in honor of his sixtieth birthday.

Not so many years ago Harvey Cushing wrote in an essay "The Personality of a Hospital," that as human beings are truly much alike inside, so are hospitals. They differ chiefly — both hospitals and human beings — in their external trappings, in their occupation, and in their personality. When Dr. Cushing made this remark the Peter Bent Brigham Hospital was, as he said, a very young hospital and still with a character not fully developed. Now the Peter Bent Brigham Hospital is nearly twenty-five years old — not very old to be sure as hospitals go, but perhaps old enough to be taken seriously. After all the Massachusetts General Hospital was only twenty-five years old on Ether Day 1846, when Dr. Warren said, "Gentlemen, this is no humbug" and thereby made the Ether Dome one of the medical historical landmarks of the world.

In looking over the contents of Dr. Christian's Birthday Volume one is struck by the wide range of subject matter considered by the clear and lucid manner in which the material is presented, and chiefly, by the diverse interests and occupations of

the various writers whose work makes up the book. There are scientific articles by professors of medicine in medical schools scattered all over the country; there are clinical articles by successful practitioners of medicine in towns or cities in widely differing localities; there are articles by men who have devoted their careers to advancing medical knowledge through investigation, and articles by men who feel that they can best help medical progress by devotion to patients and by better clinical work. Again and again in reading the various papers that comprise the volume one is impressed with the forcefulness of Dr. Christian's and the Peter Bent Brigham Hospital's personality. For almost every author manages to insinuate somehow in his material the feeling that what he has acquired in the way of ideas, development of character and growth, or ability in expression, goes back to what he learned in his house pupil days under Dr. Christian at the hospital.

Example has much to do with the perpetuation of vitality in a hospital. As Dr. Christian said he who is willing to do something more than follow a prescribed routine and who merges himself most with the active indoor life of the institution, giving even at personal sacrifice the most time to the attainment of this end is certain to be the best and longest remembered. Dr. Christian's Birthday Volume is a tangible expression of this idea. It is a far better portrait of Dr. Christian's ideals and of his influence in the Peter Bent Brigham Hospital than could be painted in any other way. It is a handsome tribute to a wise and unselfish teacher.

**Clio Medica: Tuberculosis.** Gerald B. Webb. 205 pp. New York: Paul B. Hoeber, Inc. \$2.00

This little volume of some 200 pages and fourteen chapters and an excellent bibliography is one of a series of primers on the history of medicine. For those who are interested in this subject and particularly the development of sanatorium treatment and the gradual increase of our knowledge of the pathology of tuberculosis, this book will be of value. Dr. Webb writes in an attractive style so that the book is easy to read and of distinct interest.

**Doctor Morath.** Max René Hesse. 414 pp. Boston: Houghton, Mifflin Company. \$2.50

This is a novel depicting the early career of a young German surgeon who migrates to one of the South American cities. The author is evidently a doctor, as the life in the German Colony Hospital with descriptions of operations and medical episodes could have been written by no one else.

As a novel, the book is interesting and meaty. As a picture of South American life, particularly among the German expatriates, it is instructive. It leaves one with a very definite feeling that whatever the shortcomings of medical practice in Boston, a conscientious doctor would be vastly happier here than he would be in South America.

# The New England Journal of Medicine

VOLUME 215

AUGUST 6, 1936

NUMBER 6

## The Massachusetts Medical Society

### SECTION OF PEDIATRICS

Lower Section Room, Municipal Auditorium, Springfield,  
Wednesday, June 10, 1936

#### PRESIDING

Dr George P Hunt Pittsfield Chairman

Dr James M Baty Belmont and Boston Sec  
retary

#### Panel Discussion on 'Rheumatism and Rheumatic Heart Disease in Early Life'

Dr John Lovett Morse Boston Leader

Dr Eli Friedman Boston

Dr Hyman Green Boston

Dr T Duckett Jones Boston

Dr Tracy B Mallory Boston

Dr Oliver H Stansfield Worcester

Dr Paul D White, Boston.

CHAIRMAN HUNT *Members of the Section of Pediatrics*—Your officers this year believed that possibly to the general practitioners this sort of discussion would be most interesting instructive and helpful Through the kindness of the leader it has been possible to arrange for this meeting this group of gentlemen who have put a lot of thought, effort and study into the subject of rheumatism and rheumatic heart disease in early life We are particularly fortunate in attempting at least, to cover the etiology pathology symptomatology treatment and prognosis and we are going to close promptly at 1130 so that the members can attend the Annual Meeting at the Hotel Kimball

It is an extreme pleasure to me as Chairman of your Section this year to present to you these men Dr Paul D White of Boston who will speak about the electrocardiogram Dr Tracy B Mallory of Boston the pathology Dr T Duckett Jones the etiology and the other members Dr Eli Friedman Dr Hyman Green and Dr Stansfield who will come into the discussion We want particularly the men who have given their time and effort to come down here for this meeting a very free discussion and to simplify matters I am asking members who have questions if they will please write them and pass them up to the platform so that they may be discussed and answered by the panel On the other hand if there are questions which come up on the floor I hope that members will come to the platform and use the microphone so that every word of the questions discussion and answers may be heard by everybody here

It is a great pleasure to present to this Section again Dr John Lovett Morse who will lead this discussion in Rheumatism and Rheumatic Heart Disease in Early Life Dr Morse

Dr JOHN LOVETT MORSE Mr Chairman the object of this panel is to clarify our views as to rheumatism and rheumatic heart disease in early life We are going to limit ourselves to rheumatism and acute or active, rheumatic heart disease and will not consider chronic valvular disease or late cardiac failure

I am going to treat these gentlemen as though they were my students and ask them questions and I hope I can ask them some they can't answer I hope that they will disagree with each other, but I am afraid they won't I am afraid they all think alike As to questions from the floor, if you will write them out and send them up here we will try to answer them

Now a few words as to the etiology A few years ago the question as to the etiology of rheumatism and rheumatic heart disease was apparently solved I was quite generally accepted that they were due to the *Streptococcus hemolyticus* and allergy We are not so certain now Are they caused by a virus? I am always a little skeptical about attributing a disease to a virus because it seems to me that the tendency is now, when we do not know what the cause of a disease is to take refuge in a virus the same as we used to in miasma and malaria

Dr Jones is going to discuss the etiology for us There are a few questions which I have written down here which I hope he will take up First the importance of environment and economic status Is there a familial susceptibility to the disease? If so does this mean that it is contagious? Is a vitamin C deficiency a necessary background? Does a subclinical degree of scurvy constitute the rheumatic tendency? Is there a chemical imbalance acid diathesis according to Parve which is the cause of rheumatism or which increases susceptibility to it? That sounds to me like quack medicine What is the relation of upper respiratory infections to recurrent attacks? Dr Jones

Dr T DUCKETT JONES Mr Chairman Ladies and Gentlemen—I regret that it will not be possible to answer all of Dr Morse's questions because of our present lack of knowledge I shall attempt to review briefly some of the considerations which appear pertinent to the etiology of rheumatic fever Many of the statements will be quite general and critical and minute details are impossible in the short time at my disposal. These may be supplied in the discussion should those present desire them

It will be wise to state at the outset that we do not know the etiology of rheumatic fever and in so far as I am aware no one has ever reproduced the disease process in animals Thus Koch's postulates have never been fulfilled For the past forty years an almost unlimited number of data have appeared in medical literature with various claims as to the streptococcus as a cause of rheumatic fever I will therefore deal largely with this phase of the problem

The first suggestion was that rheumatic fever was the result of a generalized streptococcus bacteremia This was suggested a few years before

the work of Poynton and Paine (1900) but these workers gave the greatest stimulus to the probability. As you may recall, these observers claimed to have isolated the agent responsible for rheumatic fever and in fact called their organism the *Diplococcus rheumaticus*. A large volume of blood culture and postmortem culture work followed during the first quarter of this century. One could cite a list of distinguished investigators who disagreed completely concerning the results of both of these methods of bacteriologic investigation. The value of postmortem cultures has been long questioned, but it remained for Epstein and Knig (1929) to demonstrate conclusively that their significance is indeed questionable. Many controversial reports appeared before Wilson (1933) and Callow (1933) indicated that blood culture work was not pertinent to the solution of the rheumatic fever problem. Both workers showed that one obtains a high percentage of positive cultures in any acutely ill patient and, further, that normal individuals with respiratory infection had as high a percentage of positive cultures as rheumatic fever subjects. This work is another instance of proper control studies resulting in a more rational evaluation of results and it does much to discourage the straight bacteremia theory. In the reports of various investigators experimental animal studies may be seen to have resulted in suppurative joint lesions and bacterial endocardial lesions. Neither of these conditions is met with in human rheumatic fever.

Small (1927) obtained an anhemolytic streptococcus from the blood of a rheumatic fever patient. Injection of saline extracts of this organism resulted in a twenty-four hour skin reaction in rheumatic fever subjects. Small concluded that this organism was a toxin producer and rheumatic fever the result of this toxin. He called this organism the streptococcus cardio-arthritis. Birkhaug likewise made such a suggestion shortly after that of Small. The therapeutic use of antisera and vaccines suggested by Small did not prove of value in the hands of other observers. Some of the pertinent criticism of this theory will be alluded to under the next suggested method of production of rheumatic fever by the streptococcus.

The allergic hypothesis was suggested by Swift (1925) and later by Zinsser (1928). This hypothesis is based on the fact that there is considerable similarity between rheumatic fever and tuberculosis, the symptoms of the latter disease being known to be allergic in origin. Further, by skin tests with various streptococcus products rheumatic fever patients were shown to be sensitive, in that they have a twenty-four hour type of skin reaction. Gibson and Thompson (1933) offered the first adequately controlled skin test study. These workers performed skin tests on large rheumatic and non-rheumatic groups. Similar ages, identical living conditions and opportunity of exposure to streptococcus infections were present in the two groups. There was little or no difference in the percentage of positive skin tests. In control groups which we have been able to study there has been relatively little difference in the percentage of positive skin tests of control children as compared with rheumatic fever subjects. There are many other objections to the allergic hypothesis. The experimental work supporting this allergic hypothesis and the clinical work indicate that man and animals, especially the rabbit, may readily become sensitive to the products of streptococci. No more definite connection has been established between allergy and rheumatic fever than the above.

It was recently suggested by Rinehart and co-workers (1934) that subclinical scurvy with additional streptococcus infection might well result in

the human disease rheumatic fever. Experimental lesions were produced in the heart of the guinea pig by deficiency diets and superimposed streptococcus infection. These lesions were not the characteristic lesions of rheumatic fever, but there were some points of similarity. In a series of guinea pigs we were able to reproduce these lesions with ease. However, the same lesions resulted in animals with acute scurvy and our work suggests that the lesions reported by Rinehart are the effect of complete scorbutus on the heart of the guinea pig. The skepticism of this etiologic mechanism is further warranted in view of a dietary experiment which we have performed at the House of the Good Samaritan, and the recent report of Sendroy and Schultz (1936). These observers present a detailed study concerning ascorbic acid metabolism and utilization in rheumatic fever subjects and controls. Their work does not support Rinehart's hypothesis.

The work of Coburn of the Presbyterian Hospital, New York, is by far the most important recent work in connection with the etiology of rheumatic fever. The first report of this work appeared in a book called 'The Factor of Infection in the Rheumatic State' which appeared in 1931. Many details and arguments must be omitted because of lack of time. Coburn is impressed with the association between hemolytic streptococcus pharyngitis and tonsillitis and subsequent rheumatic fever. He transported a group of eleven rheumatic fever subjects to Porto Rico and noted great clinical improvement in all of the patients. There was also a disappearance of hemolytic streptococci from the throats of these patients. Upon return to New York, hemolytic streptococcus pharyngitis was the usual precipitant of further rheumatic fever recurrences. Coburn presents further data concerning the geographic distribution of rheumatic and of scarlet fever and other hemolytic streptococcus diseases and believes this to support strongly the importance of the hemolytic streptococcus in initiating rheumatic fever. Far more important than the above are the immunologic data most of which have been presented since the original report. Some data have been presented concerning agglutination tests, complement fixing antibodies and precipitins. However, the materials used for these tests were nonspecific antigens and since his early reports, Coburn has paid but little attention to them. The more important immunologic test is the determination of antistreptolysin. This antibody was described by Todd (1932) who found by animal work that the hemolytic streptococcus is capable of producing a specific hemolysin. By immunization a specific antihemolysin developed which has been called antistreptolysin. This antibody can be easily titrated and the technique in performing such tests is satisfactory and dependable. The association between hemolytic streptococcus infection and recurrent rheumatic fever has been previously noted. Coburn presents evidence that, in his series, the development of antistreptolysin occurs at the time of the recurrence of rheumatic fever. This immune body may be found in any individual with a recent hemolytic streptococcus infection. As a rule it appears at the end of the second or during the third week of the infection. This is the usual interval between respiratory infection and the symptoms of a rheumatic fever recurrence. Because of the above facts and others which I am unable to relate, Coburn feels that 'rheumatic disease is a result of the following sequence of events: (1) Infection with toxin-producing strains of hemolytic streptococcus initiates a process peculiar to rheumatic subjects; (2) In the course of this process a substance is released presumably from the antibody

producing tissues which either directly or indirectly alters mesodermal structures. This substance is probably not the infecting organism and at the present time there is no evidence to suggest that it is viable. (3) The release of this toxic substance seems to take place only when there is an immune response to hemolytic streptococcus. He further states that the evidence which he has collected indicates that the activity of the rheumatic process depends not only upon the effectiveness of the infecting strain of hemolytic streptococcus but also upon the intensity of the immune response of the rheumatic subject to this bacterial agent.

This conception of the important rôle of the hemolytic streptococcus in rheumatic fever warrants serious consideration in view of the clinical significance of respiratory infection in rheumatic fever. It has been our experience that the association is a very close one. We have also observed that other agents or events seem to influence or precipitate recurrences of rheumatic fever. This suggests that streptococcus activity during respiratory infection might be of secondary rather than primary importance. These other agents or events (Bland and Jones, 1935) consist of an occasional nonstreptococcus infection or disease operative procedure—unexplained fevers, trauma and typhoid paratyphoid vaccine.

In order to evaluate the possible rôle of the hemolytic streptococcus in rheumatic fever it was thought necessary to study a large group of control subjects from an immunologic standpoint. Such subjects were studied in a manner similar to that of the rheumatic fever subjects with respect to frequency of tests etc. It has been necessary to collect data on a series of individuals from a wide variety of sources. They were collected with consideration of age, social strata, environment, disease and so forth. Data were obtained on 784 rheumatic fever subjects and nearly twice as many controls. The total series represents 2128 subjects and 4452 samples of serum. In the rheumatic fever group recurrences of rheumatic fever followed 54 per cent of 255 observed sore throats. There were rheumatic fever recurrences following 32 per cent of 323 observed colds. Rheumatic fever recurrences resulted from 45 per cent of eighty-six various events considered to be of nonstreptococcal origin, these being 9 per cent of all recurrences. One hundred and twenty-three spontaneous recurrences of rheumatic fever without evident preceding events were observed representing 30 per cent of the series of observed recurrences. It is hence evident that nearly 40 per cent of our observed rheumatic fever recurrences were not preceded by evident clinical respiratory infection. This was a higher percentage than was anticipated prior to analysis. There were severe recurrences of rheumatic fever in all of the groups regardless of the precipitating agent.

I will present a very brief analysis of our immunologic data with especial reference to responses by antistreptolysin which is easily the most reliable hemolytic streptococcus immune body and by other immune bodies (antistreptolysin, antifibrinolysin and precipitins). It was found that of ninety scarlet fever subjects nearly 100 per cent had some hemolytic streptococcus immune body response. In fifty-six nonrheumatic children with severe sore throats nearly 90 per cent developed immune bodies. In the rheumatic fever group immune bodies developed in about two-thirds of the patients who had events regardless of whether these events precipitated recurrences of rheumatic fever or not. In analyzing the data on the immune body response with regard to the event precipitating recurrences of rheumatic fever it was found that a very high percentage of immune bodies developed

as a result of sore throats regardless of whether or not recurrent rheumatic fever resulted. The larger number of individuals with an immune response after colds did develop recurrent rheumatic fever. This was not true of the sore throat group, the percentages being practically identical regardless of whether or not the patient developed a rheumatic fever recurrence. Of the events considered to be nonstreptococcal in origin about one-third of the patients developed an immune response whether or not there was recurrent rheumatic fever. This is in striking contrast to the groups following definite streptococcus infection in which an immune response occurred in over two-thirds. In the spontaneous recurrences of rheumatic fever, an immune response occurred in about one-third of the instances. These latter data show that in some of our recurrences of rheumatic fever spontaneous and precipitated by seemingly nonstreptococcus events there was activity of the hemolytic streptococcus but that the development of an immune response in a small percentage in no way accounts for the fact that two-thirds developed definite clinical rheumatic fever without immune bodies.

In summary it may be said that respiratory infection with secondary hemolytic streptococcus infection is a common precipitating agent in rheumatic fever. Should such an infection occur the immune bodies will be found to develop in a patient regardless of whether or not a recurrence of rheumatic fever develops. Further definite clinical rheumatic fever occurs without the development of an immune response as shown by the failure of two-thirds of the groups with spontaneous recurrences and those precipitated by streptococcus events to develop hemolytic streptococcus immune bodies. Since this is true it would seem that infection with the hemolytic streptococcus and the development of the immunological response to such infection will not explain all of the facts as we see them. There must hence be some further etiologic consideration involved.

That rheumatic fever may be caused by a filtrable virus has long been a conjecture. For about three years we have been doing occasional experiments in an attempt to determine a possible virus cause of rheumatic fever. These experiments have been carried out with a variety of materials usually that obtained at postmortem or at an occasional subcutaneous node biopsy. The material has been treated in various ways and injected chiefly into monkeys by a variety of methods. Soon after beginning the work one animal developed definite severe joint symptoms. He was not killed for two or three months and postmortem findings were disappointing. About a year and a half ago a monkey developed severe joint changes and had typical nephritic edema about his eyes. He was killed on the eighth day and showed serofibrinous pericarditis, some suggestive microscopic changes in his heart and also subacute nephritis. This seemed to us to warrant extensive further study of this possible etiologic association. Further work has been disappointing. In May 1935 there appeared a report from Schlesinger, Signy and Amies of England to the effect that they had obtained small bodies by high speed centrifugation from the pericardial exudates of rheumatic fever subjects. These bodies were visible by dark field examination and were not found in nonrheumatic exudates. Further these workers reported these bodies as being specifically agglutinated by rheumatic fever sera. It was suggested that these bodies were similar to the so-called elementary bodies found in such well known virus diseases as vaccinia, psittacosis and so forth. We have observed such bodies but have had great difficulty in agglutinating them. Upon succeeding

finally, they were found to be agglutinated by sera from normal individuals as well as from rheumatic fever subjects. There further occurred spontaneous agglutination in the antigen controls and small bodies indistinguishable by dark field examination were found in blood serum from a variety of sources. It is hence not clear whether the work of these observers will be reproducible and significant with regard to the etiology of rheumatic fever. If, however, this work proves to be of value, we must still produce the disease in some animal and until this is accomplished I feel that the etiology of rheumatic fever will remain questionable.

**DR MORSE** I have listened to what Dr Jones had to say with a great deal of interest but I still do not know what is the cause of rheumatic fever. Dr White will you tell us what the cause of rheumatism is?

**DR PAUL D. WHITE** I will beg the question by asking one of Dr Jones, if I may. That is with reference to the attacks of acute rheumatism following various events. If I recall correctly, he said that 66 per cent of the attacks followed respiratory infections and 33 per cent followed nonrespiratory infection factors. I am wondering if that is about the ratio of occurrence of these happenings in the course of these patients' lives, in the winter for example are they more likely to have colds than to suffer from other conditions? Can he relate these percentages to the actual disturbances in childhood?

**DR JONES** First I think Dr Morse's remarks are important because we do not know the etiologic factors. With regard to Dr White's question 60 per cent of the observed recurrences of rheumatic fever followed respiratory events and in 40 per cent there seemed to be no respiratory infection factor. I agree that respiratory infection is common in rheumatic fever subjects and that one would expect such infection to be a common precipitating factor in this climate. Fully one-half of rheumatic fever subjects, certainly of those with recent active rheumatic fever will show rheumatic fever symptoms after any respiratory event. It would seem probable that respiratory infection, as shown in our series represents an important factor in the life cycle of the disease in this climate. The influence of the disease by such factors may be secondary and not necessarily of primary etiologic significance.

**DR MORSE** I think perhaps we can pass over etiology and go on to the pathology. I am going to ask Dr Mallory to speak of the pathologic changes which as I understand it, are of two types, proliferative and exudative. I hope he will not only describe them but also explain to us why they occur. Now being an old doctor and not up to modern ideas I am especially interested in the Aschoff bodies of which we hear so much and I should like to know if the presence of any form of the Aschoff bodies means that the disease is still active. Do the Aschoff bodies ever disappear? Are the lesions of rheumatic fever ever healed? Of course the pathologist when a child dies of rheumatism or rheumatic heart disease always finds the lesions of rheumatism and his point of view usually is they never get over it. But some of us practical ones who clinically see children get well grow up and have no trouble with their hearts are rather skeptical and I would like to know whether complete recovery is possible or not. As I said I am an old-fashioned doctor and I was brought up on chronic valvular disease and so on. Now they do not use that term I think. But are not mistakes made by confusing the results of a previous

pathologic process with active disease for example, in the heart? That may be a foolish question for the modern man but it is not for me.

**DR THOMAS B. MALLORY** Ever since I have known Dr Morse he has been expecting the impossible of me. Now he wants me to tell you the pathology of rheumatic fever in ten minutes! I obviously must restrict myself to limited parts of the subject, and that means assuming that it is safe to leave out certain features. I am going to take it for granted that we are all starting with rheumatic fever in approximately the year 1920, and then I am going to try to give you a very brief survey of what has happened since.

About 1920, we all knew that rheumatic fever and chorea were associated with acute endocarditis and that the serous cavities, particularly the pericardium less often the pleura and peritoneum, were apt to show acute exudative phenomena. We knew that a great many hearts of people who died in rheumatic fever showed those peculiar things called Aschoff bodies. I think perhaps we can profitably start the discussion here by going into the subject of the Aschoff bodies, since a great deal of recent work has been devoted to them.

Various men in New York, particularly Louis Gross and Pappenheimer and von Glahn men in Leipzig Klinge, and his coworkers, have devoted the major part of their time in the last ten years to a study of the subject and have taught us many academically interesting facts. I am going to draw you a very rough diagram of the way in which an Aschoff body starts.

Throughout the body the initial attack of rheumatic fever its virus, toxin or whatever the noxious agent is seems to be upon the collagen fibers. If you look at a very early Aschoff body you will find a bundle of collagen fibers running along like that (drawing). The minute individual fibrils are cemented together into these rather homogeneous wavy bundles. Suddenly, at this point here let us say the bundle swells up to two or three times the normal thickness and the specific staining qualities are more or less lost. Then at the far end of the lesion you can see the bundle emerging again and quickly becoming normal in character. If you stain this slide with silver stain for reticulum you can show that the fibers which make up the bundle have not disappeared in the center of the apparently necrotic area but run through it as individual fibers. When the fibers are fused together in the bundles they stain with aniline blue but fail to stain with silver whereas as soon as they are separated in the lesion they stain readily with silver but not with aniline blue. So something evidently occurs to the binding substance of the bundle which permits the fibers to become separated a hyaline material is deposited which renders the fibrils invisible with ordinary stains but they still run through the area relatively undisturbed except in their staining reactions. Then around that area of altered collagen the peculiar large cells about which pathologists and histologists have been arguing these last twenty years without settling anything cluster. They evidently belong to the general group of mononuclear phagocytes but more closely than that we do not know about them. Some of them appear to be produced *in situ* because we find mitoses in the immediate neighborhood others without question emigrate there from a distant source. It is rather characteristic that they resemble to some degree the foreign body cells such as one sees in tuberculosis but they, never look quite like typical foreign body giant cells and they often as a matter of fact look

surprisingly similar to the cells seen in Hodgkins disease

Exhaustive study in the last ten years seems to show that throughout the body this focal degeneration of collagen is the characteristic effect of the rheumatic virus. For years pathologists were primarily impressed by the characteristic little wart vegetations on the surface of the heart valves. But with microscopic study of the heart valves we have most of us come to agree with Ronald Grant that the vegetations are not particularly important and that the damaged connective tissues in the deeper part of the valve are probably the more important lesion. By intensive search for changes all over the body it has been shown quite clearly that rheumatic fever is a much more generalized disease than we supposed in 1920. Klinge in particular has done this with extraordinary diligence and with rather interesting techniques. He takes an aorta and twists it into a spiral so that the entire length of the aorta can be cut in single section. He does the same with other structures such as the esophagus and he has been able to show that nearly every aorta from a rheumatic case contains numerous Aschoff bodies and that the entire esophagus for instance may be filled with them from the top to the bottom. He finds Aschoff bodies frequently in the trachea and in the capsules of the tonsils they appear in subcutaneous tissues of course as rheumatic nodules. We find them in the capsules of joints. But I personally find it very hard to believe that with the exception of the valvular lesions an Aschoff body has the slightest functional significance.

The characteristic place to find an Aschoff body is well out in the adventitia of an artery. It is simply a localized little nodule that does not surround the vessel at all. It is in the outermost and least important layer of the vessel wall and although I think it is important evidence that rheumatism is present I cannot believe that it has the slightest functional significance. On the other hand in the heart valves the identical degeneration of the collagen and the reaction to it is what leads to permanent scarring and functional impairment.

It is customary to speak of acute myocarditis in active rheumatic cases and we know that a great many patients show myocardial insufficiency with very slight valvular lesions in the acute stage of the disease. Personally I think myocarditis is a misnomer. Clinically it means myocardial insufficiency. Pathologically it has been used to mean that Aschoff bodies are present but they bear no direct relationship in number or in size to the degree of heart failure that is present. You may have many Aschoff bodies and no heart failure. You may have severe myocardial insufficiency and to demonstrate a single Aschoff body is a major piece of research.

I believe myocarditis that is real degeneration of the muscle fibers does occur in acute rheumatic hearts but I have seen it only twice and Dr Jones with wider experience in acute cases has not seen it much more often.

So that it seems to me that myocarditis is not much more appropriate a term to apply to failing rheumatic hearts than it is a suitable term for describing an hypertrophied or dilated heart in hypertension.

We have discovered also in the last few years a lot of features about rheumatic fever which are interesting but it seems to me in practice not very important. We find that the large coronary arteries the pulmonary artery the aorta, as I said are severely affected but the lesion is usually limited to the outer layers of the wall. Occasionally you get a moderate amount of dilatation and wrinkling of the wall but you don't get much scar formation and

I doubt if it is of any great importance. By a very intensive search we find that the peripheral arteries are quite often involved but the number involved in any one case and in fact in a number of cases is very slight. I do not believe the myocardial failure can be attributed to the few usually minute lesions which can be demonstrated in the coronary arteries. One should compare these cases with periarthritis nodosa or with Buerger's disease before jumping to the conclusion that the lesions would be functionally significant. Vascular changes must in general be very diffuse or very numerous to cause symptoms.

These changes are particularly extensive in the lungs and we have discovered another complication of rheumatic fever which is fairly common the so-called rheumatic pneumonitis. There is very little evidence that it is a real pneumonia. From the clinical roentgenologic point of view these cases develop with astounding rapidity and disappear with even more astounding rapidity sometimes two days later. Most of the cases that have been investigated have shown histologic extensive focal hemorrhages into the lungs and comparatively little else. Some of these cases show well marked vascular lesions. Two cases which I personally have seen have not been combined with any demonstrable vascular lesion although of course we have evidence of damage to small vessels in the form of hemorrhage very likely analogous to the rheumatic purpura which you sometimes notice in the skin.

The question comes up finally whether rheumatic fever causes damage to parenchymal tissues. It is common experience that the liver in acute rheumatism shows much more extensive degeneration than the degree of myocardial failure would justify and most people are inclined to believe that this represents specific damage due to toxic injury by the rheumatic virus.

The other condition in which parenchymal cells have been definitely and consistently proved to be damaged occurs in the case of chorea. The number of cases of chorea which have been adequately studied pathologically is very small but in those that I have seen reported degeneration of the ganglion cells has been very characteristic along with slight perivascular inflammation such as you might find in any type of encephalitis.

To sum this up it seems to me we have in the last ten years discovered a great many individual bits of information about rheumatic fever but on the whole they tell us comparatively little about the production of the symptoms or the course of the disease.

CHAIRMAN HUNT: I should like to announce at this time the appointment of a Nominating Committee for the selection of officers for this Section for 1936-37 and I will appoint on that Committee Drs. L. W. Hill and E. W. Barron of Boston and Dr. W. B. Adams of Springfield. For the benefit of those Fellows who have come in since the meeting opened I would say that we would appreciate your sending your questions to the platform so that they may be answered and discussed by the panel.

DR. MORSE: Now that we have finished the pathology and etiology we will really try to get down to business. I want to take up in the first place the symptomatology of rheumatism without apparent cardiac involvement and I am going to ask Dr. Green to tell us what are the symptoms of an attack of rheumatism in a child when there is no apparent involvement of the heart.

DR. HIRMAN GREEN: Boston. Rheumatic fever starts very insidiously. A child may have an acute tonsillitis or upper respiratory infection and



recover quickly. Then there will be a period of a week or so of perfect health. This period has been called the latent period. After this the following symptoms arise namely, pallor listlessness lack of appetite, nose bleeds joint pains or abdominal pains. With this story, one may be sure that the child is developing rheumatic fever.

DR MORSE. I will ask Dr Stansfield whether he agrees with that.

DR OLIVER H STANSFIELD Worcester. That sounds like a real case of rheumatic fever but the cases that bother me more are the ones that turn up later with signs of heart involvement. For instance within a year an orthopedic man treated a girl for fallen arches because she was complaining of her feet. Eighteen months later he found a very well developed mitral stenosis. As to the relation of upper respiratory infection to rheumatic fever I am glad to hear Dr Jones say that he could not really connect the one with the other in many cases because I never could. I do not know what the symptoms of rheumatic fever are in the atypical case, which is one of my chief worries.

DR MORSE. What Dr Green has said is very similar to what Dr Kaiser said a while ago. Dr Kaiser describes the manifestations of rheumatic infection that is a condition which is apparently continuous, as follows—loss of appetite, pallor chronic fatigue fleeting pains, headaches nose bleed, nervousness, and other vague complaints. Now these to me may be manifestations of rheumatic infection but I wonder if there are not a good many other conditions in childhood which cause headaches loss of appetite, pallor, nervousness and other vague complaints. I am skeptical personally about saying that every child that shows these symptoms has a rheumatic infection. I think that there must be a lot of other causes for pains in children besides rheumatism. You get the ordinary social worker that is looking for cases a series of cases of heart disease for example and she will find that every child has had a pain at some time or other. They all have pains at some time or other. I wonder if children do not have pains sometimes, not because they are growing but because they have played hard and become tired and whether they may not have some irritation of the epiphysis, and so on. And I should like to know what latent rheumatism really is. I do not like that term. I suppose a good many of us came here in automobiles so that we all have the latent possibility of an accident before we get home. I should like to know what the "rheumatic state" is. That seems to me just a name. I can't see what it means unless it means an active rheumatic infection. Then why not call it rheumatism? I know I am trying Dr Jones' temper in saving some of these things. I am going to ask Dr Friedman to say a word or two first and then we will give Dr Jones a chance.

DR FRIEDMAN. My conception of the rheumatic state is broad enough to include certain acute illnesses which are often associated together. They are polyarthritis chorea carditis recurrent attacks of nose and throat infections rheumatic nodules growing pains and certain forms of rashes like erythema multiforme. All of the above conditions may be caused by rheumatic infection and on account of the locality of the infection they have different manifestations.

When I see a child who shows any of the above mentioned conditions I consider the possibility of rheumatic infection being the underlying cause. If you have one symptom alone the diagnosis may

not be clear but when you have two or more symptoms associated together, the diagnosis of rheumatic infection becomes more apparent. We must of course rule out all other conditions with similar symptoms before we make the diagnosis of rheumatism. When our knowledge of the bacteriology of rheumatic infection is more clearly established the diagnosis will become much more definite. When a child shows pallor, loss of weight and complaints of so-called growing pains one must bear in mind the possibility that this child may be suffering from rheumatic infection.

DR MORSE. I will now ask Dr Jones to say what he thinks about it.

DR JONES. I agree heartily with Dr Morse. A definite diagnosis of rheumatic fever can be made only when the clinical picture is more or less complete. I prefer the term "rheumatic fever" or "rheumatic fever subject to that of the rheumatic state." To make a diagnosis of latent rheumatism is difficult and I should say impossible unless the child develops evidence of rheumatic heart disease or some manifestation of it, say a prolongation of auriculoventricular conduction by electrocardiogram. In this connection I believe the terms rheumatic state or "prerheumatic child" are clinically misleading and will remain so until we have a definite test for the disease rheumatic fever. Hence if there is vague symptomatology in a child without a previous definite history of rheumatic fever the development of rheumatic heart disease would seem the only definite proof of the exact nature of the illness.

DR MORSE. Dr Green wants to talk about pains.

DR GREEN. I think the question of pains should be investigated thoroughly because the history of pains may be misleading. I recently had a case of a boy of eleven years who complained of pains all over making it difficult to tell from the story whether he had rheumatic fever. He had flat feet and poor body mechanics. After giving him plates for his feet and exercises for his posture he was able to walk well and did not complain of any more pain. Therefore flat feet and faulty posture should be considered in every history suggesting rheumatic fever.

DR MORSE. I am interested to hear what Dr White has to say about this.

DR WHITE. In our consideration of the symptoms if we exclude other conditions after a child has been ill for a few weeks and other tests such as the electrocardiographic examination, of which I will speak a bit later indicate some damage to the heart or if there is evidence of enlargement of the heart we may make a diagnosis of rheumatism even without rheumatic pains. If my own experience is correct definite rheumatic pains and arthritis are much more common in older children and in adults than in the youngest children at about the age of four or five years. I would like to ask Dr Jones if that is his experience too.

DR JONES. I think that the older the child the more apt he is to have definite joint involvement but we do see it at times in the very young. It is however not an important feature of the disease syndrome. In our series of some 1400 rheumatic fever subjects about 70 per cent had varying degrees of joint symptomatology at some time or another.

DR MORSE. I suppose everybody agrees that rheumatic nodules are a positive proof of rheumatism. I will ask Dr Green his opinion.



DR GREEN As far as rheumatic nodules are concerned it takes keen observation and considerable experience to find them. Most men in practice do not know what they are and have never seen them. It is important to search thoroughly for them as they are pathognomonic of rheumatic fever. They frequently occur on the top of the head and may be the size of a marble. One was recently removed in a large Boston hospital for a question of sarcoma but on microscopic examination it proved to be rheumatic fever.

DR MORSE I would like to hear from Dr Jones.

DR JONES This would seem to be a question for Dr Mallory. I have rarely seen erythema nodosum in our rheumatic fever subjects. A few years ago Dr Sprague reviewed all of the erythema nodosum series at the Massachusetts General Hospital and found that in only a few instances did any of the patients have rheumatic heart disease. The work of Collis is pertinent. This English observer demonstrated that the lesions of erythema nodosum could be reproduced in about one-half of his patients by the injection of tuberculin. In the other half the lesions were reproduced by streptococcal products. There seems very little evidence of any close clinical association between erythema nodosum and rheumatic fever.

DR MORSE Dr Mallory.

DR MALLORY I was not sure from what Dr Green said whether he thought there might be accidental confusion between erythema nodosum and rheumatic nodules. From the histological point of view the two are entirely distinct that is one can easily recognize the rheumatic nodule.

DR MORSE I want to take up next the symptomatology of cardiac involvement in rheumatism. All agree that involvement of the heart is common and that it is the one serious thing in rheumatism in early life. All agree that all parts of the heart are involved that is that it is a carditis. How common is involvement of the heart? Is it always involved in every case even when there are no symptoms? I suppose it always is in fatal cases. Is it in cases in which no signs of involvement are apparent? What are the symptoms and signs of involvement of the heart? How shall we make the diagnosis? Some of the points which I think ought to be considered are the temperature the rate of the pulse the size of the heart. Now when we come to the question of the size of the heart can we determine it by percussion or not? If we do do we go by the absolute size of the heart as we determine it or by the relation of the diameter of the heart to the diameter of the chest? Do we have to take x-rays of the heart in order to determine the size? What is the comparative importance of the size as determined by percussion and by x-ray? Then murmurs and here we have to take up the differentiation of functional and organic murmurs the white count and Schilling's differential count the electrocardiogram the sedimentation test. Now those are all methods to be used. How about the general practitioner who cannot do the sedimentation test probably cannot get an electrocardiogram or even an x-ray. He can do a white count. He can percuss. How well can he get on with his ears hands and brains alone without the sedimentation test electrocardiogram and so forth? Then a little later I want to find out what potential heart disease is. Still later I want to find out how to diagnose a new infection of the heart in a fresh attack of rheumatism in a child who has previously had involvement of the heart. I hope they can tell me Dr Friedman

suppose you tell us something about the symptoms and signs of involvement of the heart.

DR FRIEDMAN As I said before when the involvement of the heart is not marked it is much more difficult to make the diagnosis. When you have marked involvement with definite hypertrophy the diagnosis is obvious. When the child has fever signs of dyspnea and precordial pain the possibility of carditis should be suspected even though careful examination does not show any murmurs. Once again I want to stress the importance of erythematous rashes which are so common in rheumatic infections and so often overlooked as insignificant.

If you suspect rheumatic infection and your attention is focused on the heart action you will often find evidence to corroborate your suspicions. The mother may volunteer the information that the child tires easily does not join other children at play and gets out of breath on slight exertion. The milder the infection and the milder the symptoms the more difficult the diagnosis will be. If however you keep the possibility of rheumatic infection in mind and remember that it may have various manifestations the diagnosis will be less difficult.

DR MORSE I think perhaps before we take up the comparative value of the symptoms I will ask Dr White to say a word or two about the electrocardiogram in connection with the heart in childhood.

DR WHITE Before I begin the discussion on electrocardiography may I ask two important questions of Dr Mallory? One is with reference to the significance in later life of coronary involvement by rheumatism in youth that is the question of serious coronary disease induced by a previous rheumatic infection. It is my own belief that rheumatic coronary involvement is not an important factor in later life. And the other question relates to the belief of Coburn and others that there may be extensive early changes in the myocardium hemorrhagic or otherwise before the Aschoff bodies are formed that is that the Aschoff bodies are rather late manifestations and that serious lesions may occur prior to their appearance. I would like to have Dr Mallory answer those two questions.

DR MALLORY In answer to the first question I can only say that from the material which has fallen within my experience I have not been impressed with the importance of coronary artery involvement in rheumatic fever. It is perfectly true that children dying with acute rheumatic fever will often show early acute atheromatous lesions in the coronaries but Dr Timothy Leary and others have shown that acute lesions of the coronaries follow a great variety of acute infections in childhood. It is probably rather rare but I do not doubt it happens in rheumatic fever. I question whether it happens oftener however than in any other acute infection.

As to the second question as I said before I have seen two cases with very acute myocardial degeneration in acute rheumatism. The experience everywhere however is that it is a comparatively rare thing. In twenty acute rheumatics dying in the acute stage of the disease I doubt if more than two or three would show degeneration. If Coburn has more than that I think he probably has had a rather exceptional group of cases. However it is a type of thing that will have to be checked in a very large number of cases before we are sure and no one person sees enough acute rheumatic cases to get very satisfactory statistics.

DR WHITE I believe that almost everyone will agree that the heart is practically always involved

in the acute rheumatic infection, but that the involvement may be so slight in some cases that we never have any signs or symptoms from it. Probably about 20 per cent of the rheumatic cases and a very large percentage of the cases of so called pure chorea escape evident heart damage.

It has been shown that the electrocardiogram has an important use in cases of myocardial involvement of any sort. If there happens to be a lesion in the bundle of His or other conducting tissues of the heart if the myocardium itself is extensively involved or if the pericardium is seriously affected we will find changes in the electrocardiogram, which may thus be a useful record in the study of the rheumatic infection.

My own interest in the subject dates back to twenty years ago when we discovered, in the Outpatient Department of the Massachusetts General Hospital a young man aged eighteen who showed by graphic record partial heart block (at first clinically diagnosed as sinus arrhythmia). It was more or less by chance that we took the graphic record. This heart block developed a few days after tonsillitis and just preceding an attack of acute rheumatic fever and so was the first conclusive evidence of rheumatic infection. The heart block lasted only a few days and ten years later I found the heart to be perfectly normal.

Since that time our experience with the electrocardiograms of some hundreds of cases of acute rheumatism in childhood has demonstrated as has that of others a good many instances of abnormalities which are usually corroborative of other clinical evidence of the infection but occasionally are important signs in themselves of the presence or the existence of active infection, rarely do the abnormalities become set or chronic. Although these abnormalities are not pathognomonic of this infection, they are found in it more often than in any other infection in childhood, barring severe uncontrolled diphtheria.

A review which I made yesterday of fifty recent cases of acute and subacute rheumatism at the House of the Good Samaritan in Boston will well illustrate what we may expect to find. From one to fifteen electrocardiograms daily to monthly were taken in each of these cases, averaging five or six apiece. There were fifteen males and thirty-five females, ranging in age from two to twenty-two years, with the great majority (forty-four) ranging from five to fifteen years inclusive. Nine of these fifty cases died. Autopsies in seven confirmed the diagnosis; permission for an autopsy was not obtained in the other two cases.

The electrocardiograms were wholly normal in thirty-six of the fifty cases or 72 per cent. Including all eight cases of uncomplicated chorea and all six cases of chorea complicating rheumatic fever and also including four of the nine fatal cases.

Heart block of the auriculoventricular type partial in degree with prolonged P-R intervals (up to 0.25 second) and without dropped beats except in one case with 2:1 block was found transiently in eight cases (16 per cent) including three of the nine fatal cases. In one of these eight cases digitalis was quite probably responsible at least in part.

Bundle branch or intraventricular block was found in slight degree in but one case with left axis deviation.

Sinoauricular block (unimportant) was present in one.

Auricular premature beats were found in one case and ventricular premature beats in none.

Auricular fibrillation occurred in one case a girl of nineteen years with mitral stenosis and a history of a previous attack of rheumatic fever five years before.

Left axis deviation of abnormal degree was found in two cases one of whom had aortic regurgitation. The R wave in lead 2 was split in one other case. There was no case of abnormal right axis deviation.

The T waves were abnormal in six cases very high in one inverted or diphasic in Leads 1 or 2 in four, two of which were digitalized, and inverted of coronary type (probably due to pericarditis), in one case.

The following additional statistics may be of interest.

Massachusetts General Hospital Electrocardiographic Series	Bundle branch block 323 cases with a history of rheumatic fever in 47 (14 per cent)
	Complete auriculoventricular heart block 72 cases with rheumatic heart disease in 3 (4 per cent)
	Right axis deviation 288 cases 53 per cent had mitral stenosis
	Mitral stenosis 100 cases 51 per cent had abnormal right axis deviation.
	Aortic regurgitation 50 cases 40 per cent had abnormal left axis deviation
	Big P waves 132 cases 72 (55 per cent) had mitral stenosis

Kings series of 150 cases of bundle branch block contained fifteen rheumatic cases (10 per cent).

There have been even a very few cases of the Adams-Stokes syndrome in rheumatic fever like Faulkner's case of 1930.

**Conclusions.** Electrocardiograms in rheumatic fever are useful but not often essential. They may be normal in fatal cases and abnormal in mild cases but the more severe the infection the more likely are abnormalities to be found. In that respect the electrocardiogram in the rheumatic infection is somewhat comparable with the electrocardiogram in coronary disease.

Dr MORSE. I see many cases from time to time in which physicians have mistaken murmurs made outside the heart or functional murmurs for organic murmurs. It is very important to distinguish between them when you are making a diagnosis of rheumatic heart disease and I will ask Dr STANSFIELD to say a word about the differential diagnosis of these conditions, remembering that we are talking about acute rheumatic heart disease not about chronic.

Dr STANSFIELD. This looks to me like a good place to display ignorance. I suppose we all do agree that functional murmurs exist at least we hear a soft murmur which is not transmitted in any direction and does not seem to mask any of the normal heart sounds. We will assume the first time you see the child in perfect health he may display a murmur and finally conclude because it is not being propagated in any direction that it must be a functional murmur whatever a functional murmur is. But if the child is sick as Dr Green described when these children are in more or less chronic ill health it is a little bit more of a problem to decide whether you are dealing with what I will call a nonpathologic murmur or a pathologic murmur. Of course you go by the signs that you find around the heart.

I think by taking the general status of the case

particularly the manifestations of abnormality about the heart and other symptoms, you can come to a reasonably just conclusion as to whether you are dealing with a functional or organic murmur

DR. MORSE Dr Stansfield has already answered the question I was going to ask the others, that is the question of percussing out the size of the heart I am going to ask each one in turn What do you say Dr Friedman? Can you percuss the size of the heart?

DR. FRIEDMAN It all depends on whether the hypertrophy is slight In marked hypertrophy it is very easy to demonstrate it by percussion When the hypertrophy is slight, I rely more on the position of the apex beat and I like to check my findings with an x-ray plate

DR. JONES Unless you are dealing with extremely thick chests or patients with large breasts I believe it is possible by percussion to determine the size of the heart fairly accurately

DR. GREEN I think it is possible to determine the size of the heart particularly in older children In the hospital the x-ray is used as a further check on percussion The greatest difficulty is to determine the heart size in infants

DR. MORSE The reason you can't percuss the size of the heart of an infant is because you hit it too hard

DR. WHITE Most children have chest walls that are thin enough to allow fairly accurate percussion of the heart if the doctor is willing to take time enough to learn how to percuss but so many physicians and medical students in recent years have been taught that they must have an x-ray examination of the heart that they have lost the art of percussion or never acquired it I am quite certain that cardiac percussion should be actively taught again It is more difficult in adults to be sure but in children, as a rule, the heart can be reasonably well percussed One should always percuss in the third left interspace as well as at the cardiac apex because if there is marked prominence of the pulmonary artery one can almost always determine it by percussion

DR. MALLORY I naturally would not be rash enough to try to percuss a heart but I probably have had more experience than any person present in checking other people's percussions and I emphatically say there are some people who can percuss a heart fairly accurately in a good many chests there are some chests in which nobody could possibly percuss a heart and there are some people who can't percuss a heart correctly in any chest

DR. MORSE We are getting a little bit behind time I am afraid I think we can all tell what the temperature is and can also count the pulse all right, and apparently, if you know how, you can percuss out the size of a heart, and if you use your ears you can tell the difference between functional and organic murmurs It is of course, not difficult to make a white count Practically all children that are sick have an elevation of the white count whether they have cardiac involvement or not so that to my mind it is not of a great deal of importance Those who do not agree with me will hold up their hands (Nobody held up his hand) Schilling's differential count is of some importance Dr White has told us about the electrocardiogram Nobody has said anything about the sedimentation test If any of you have ever seen it done, you know

it takes a long time I will ask Dr Jones to say what it is in about a minute

DR. JONES The sedimentation rate is certainly of distinct value It is probably of more value clinically than the white blood count, but is not an absolute criterion of active rheumatic fever However, if the test is performed by the method of Ernestine and Rourke, in which there is a correction for anemia one learns not only an indication of active infection, but also whether the patient needs iron therapy

DR. MORSE Now I want to ask you all the same question, the one I referred to in the beginning That is, can the general practitioner make the diagnosis of cardiac involvement in rheumatism in childhood with his ears hands and brains alone? Yes or no Dr Friedman.

DR. FRIEDMAN Yes on the whole but I qualify it.

DR. JONES Yes

DR. GREEN Yes

DR. STANSFIELD Of course you can

DR. WHITE But we must distinguish between temporary and permanent involvement of the heart We have difficulty in doing this often at first we sometimes must wait to see whether the signs disappear before diagnosing permanent valvular disease

DR. MORSE Here is a question from the floor for Dr White to answer

DR. WHITE Are there electrocardiographic changes in young children with only transient pains? Rarely The electrocardiogram in a study of rheumatic cases is somewhat like the electrocardiogram in the study of coronary disease We may have severe coronary disease with angina pectoris with a normal electrocardiogram That may also happen with rheumatism We may have fatal cases with normal electrocardiograms, or we may have in a mild case a change in the electrocardiogram but as a rule the more severe the infection the more changes in the electrocardiogram

DR. MORSE Now we come to treatment Everybody agrees I suppose that the child with acute rheumatism whether it has or has not involvement of the heart should be put to bed and kept in bed Now the question is how long should a child with acute rheumatism, without apparent involvement of the heart, be kept in bed? How long should one be kept in bed with involvement of the heart? How are we going to decide rightly? How is the general practitioner going to decide? I think I will ask each one to state briefly what his opinion is on that subject

DR. GREEN The most difficult question of all is how long to keep the child in bed In the past few years the sedimentation rate has proved a valuable laboratory procedure for the presence or absence of infection When it is normal, it is good evidence that the infection has subsided Heretofore we have relied on our clinical evidence namely normal temperature and normal pulse rate In the home we should allow a child up when the color has improved the appetite has returned when there is a gain in weight and normal temperature and pulse

DR. JONES I firmly believe that rheumatic fever subjects should be kept in bed much longer than their clinical manifestations last Further I believe that laboratory studies are of great value in deter-

mining the presence or absence of active rheumatic fever and as a therapeutic guide. Clinically evident heart disease may develop when there is only laboratory evidence of infection. I also feel that rest is important so long as there is any evidence of infection. Without laboratory studies the general practitioner will necessarily have to be very cautious in evaluating the clinical picture and allowing the patient to resume physical activity. Laboratory evidence of infection may persist for long periods and at this time there is a peculiar susceptibility to recurrences of rheumatic fever. There is good reason, therefore, to insist on long bed rest.

Dr. FRIEDMAN: You can't generalize on this subject. If the general condition of the child is improving and the infection as shown by the temperature and pulse is quieting down, we can think about letting the child up, but even then it is better to err on the safe side by keeping him in bed a while longer.

Dr. STANSFIELD: I have always had the feeling that rheumatic fever was somewhat analogous to tuberculosis and that the treatment should be along that line. My own habit is to go very slowly and feel skeptical about recovery to the extent of not letting patients up in less than three months. Of course it does happen that they may get up some times sooner than that, but if you permit that you want absolute evidence, all the evidence you can get, that it is safe to do it and if there is any doubt about it a little bit longer won't hurt.

Dr. MORSE: I have a question here for Dr. White. How long in weeks or months approximately?

Dr. WHITE: It is not only because of the infection that we need to treat these patients with prolonged bed rest. Involvement of the heart is equally important in demanding rest. The length of time will vary from weeks to months even to years, as the individual cases require. It used to be the custom in the treatment of coronary thrombosis to allow the patient to be up after a few days with the risk of a permanently dilated heart. It is quite likely that the heart in acute rheumatic fever will dilate more or remain more dilated and damaged if the patient is allowed to be active too early. This seems probable but we have little or no proof. We are trying to collect that proof now. The difficulty lies in securing enough control cases.

Dr. MORSE: There are one or two questions as to drug treatment. In the first place, how about salicylates? Do you use them or not? What do they do? What is the dose?

Dr. FRIEDMAN: Yes, I use them because they relieve the symptoms and make the patient more comfortable. Whether they have any specific action on the infection I do not know.

Dr. JONES: I do not believe that salicylates are specific. We use them frequently for the comfort of the patient, but do not expect them to prevent the development of or increase in heart disease. There are two cautions in the use of salicylates which seem pertinent. When patients are over the acute stage of rheumatic fever it is unwise to keep them on large salicylate dosage because the symptoms are masked and intelligent therapy would necessitate knowing whether the patient had mild clinical symptoms. Salicylates hence give a false sense of security. Neither is there any real evidence that salicylates prevent the recurrence of rheumatic fever. The prophylactic use of salicylate was some years ago advocated by English observers. In reviewing their series the first record reviewed was that of a child with mitral disease. Following a

severe sore throat massive doses of salicylates were given for two or three months. Though clinically well during the time aortic disease was found when the child was re-examined. This indicates to me that rheumatic fever had been active and the symptoms masked by salicylates.

Dr. GREFN: Salicylates are used at first up to sixty or more grains a day reducing the dose according to the relief of pain. We have used salicylates during the period when the child is up and about with the idea of attempting to prevent recurrences. This procedure has been carried on in our clinic for about ten years but as yet we have not collected our statistics to prove this point. Our feeling however is that it has made some difference in the number of recurrences.

Dr. STANSFIELD: I use salicylates for the same reason that the other gentlemen have given although I sometimes wonder when I order them how much tradition there is in the business.

Dr. WHITE: During the World War there was an epidemic of rheumatic fever in a certain camp in France and a considerable number of patients came into our hospital from that camp within a comparatively short time. These patients were separated into two groups. To one group we gave large doses of sodium salicylate with sodium bicarbonate while to the others we gave phenacetin and other analgesic remedies. The group that took the salicylate quickly cleared up. The joint symptoms disappeared within twenty-four to thirty-six hours and the fever went down rapidly. The patients in the other group after two or three days were still very uncomfortable. They learned of the experiment and we could not continue it any longer. There was not the least doubt about the specificity of the salicylates so far as the arthritis itself was concerned. On the other hand in young children with acute rheumatic heart disease and very little or no arthritis it is unwise to use salicylates regularly because they are likely to mask evidences of active infection.

I should like to ask Dr. Morse a question if it is permissible. Does he think that salicylate therapy may control a pericardial effusion?

Dr. MORSE: I am afraid my experience is rather limited, but I should say no.

The next question I want to ask is is it proper to give digitalis for rheumatic heart disease when there are no signs of cardiac failure?

Dr. WHITE: No.

Dr. STANSFIELD: No.

Dr. GREFN: No.

Dr. JONES: No.

Dr. FRIEDMAN: No.

Dr. MORSE: There is a question here just handed up whether digitalis should be used when there is acute rheumatic fever with evidence of cardiac decompensation. I should answer yes, though it probably would not do much good if the involvement of the heart is acute and there is no chronic lesion. I will let the others say what they think.

Dr. WHITE: I think it helps but I am not certain about it. It is always worth while to try it in adequate dosage but during a very active infection it may be valueless.

Dr. STANSFIELD: I have nothing to say.

Dr. GREFN: I think it should be given in acute decompensation.

Dr JONES I have occasionally seen good results from it but have often wondered whether it was due entirely to the diuretic effect.

Dr. FRIEDMAN When it can do no harm and may do some good, I should use it

Dr MORSE The questions are coming up here thick and fast. The next question is Do you prefer sodium salicylate to aspirin? Dr Jones

Dr. JONES We use aspirin almost entirely and because it is better tolerated by the average child than sodium salicylate

Dr. MORSE Now a word or two as to preventive treatment. When the acute attack is over with no apparent cardiac involvement, or cardiac involvement but no symptoms what do you recommend? I am afraid there is not time for everybody to say what he does about that. Perhaps we will ask Dr Green to tell us in two minutes what he does

Dr GREEN In the way of preventive treatment foci of infection such as bad teeth and infected tonsils should be removed and efforts should be made to increase weight gain by proper nourishment and rest periods

Dr MORSE I think a good point to be remembered is that a few years ago these children were too much limited in their exercise and in their lives and that probably it is safe to let them do more than they have done in the past that they are better for it. I wonder if the gentlemen here agree? [Answer in the affirmative]

The next question we have is as to the use of salicylates in preventive treatment. I think that has been pretty well answered already and I should think that the gentlemen here would not agree with Kaiser's continuous treatment with aspirin and magnesium oxide

The next thing I have here to discuss is the tonsils whether to remove them or not and the results to be expected. If we had another session this afternoon we might be able to discuss this matter in detail. My general impression is based on the work of Kaiser that removal of the tonsils possibly removes a certain predisposition to rheumatism but that if the tonsils are removed after the child has had rheumatism and rheumatic heart disease it does not diminish the number of attacks

There is a question here as to how much attention should be paid to the sedimentation test in deciding when to remove the tonsils. That of course will bring up the question also as to whether the tonsils should be removed in an acute attack or whether one should wait until the acute attack is over. I think perhaps I will ask Dr Jones to answer that question and if the others disagree they can say so

Dr JONES I have not personally had any experience with the removal of tonsils during acute rheumatic fever. At the Boston City Hospital whence the suggestion came I understand that the procedure is rarely carried out at present. There has been increasing skepticism during the past few years of the value of tonsillectomy. It further appears evident that if tonsillectomy is determined upon the operation should be performed when there is no evidence of rheumatic fever clinical or laboratory. Many recurrences of rheumatic fever could be avoided if this caution were generally applied. I have seen fatal issues result from recurrences apparently precipitated by tonsillectomy. Since the beneficial result of such an operation is questionable it would seem wise to err on the side of safety and remove the tonsils only after the disease has subsided.

Dr GREEN I should like to ask Dr Mallory how often he has found Aschoff bodies in tonsils

Dr MALLORY I have never personally looked for them but Klinge finds them in large numbers in a large percentage of cases in the capsule of the tonsil that is the connective tissue just behind the tonsil itself. I think there is no reason to question his figures

Dr. MORSE Dr Friedman if all your cases were rich would you send all the children with 'latent', potential rheumatic heart disease South for the winter, and if you would why would you do it? Would it be because you believe in that kind of treatment or because of some other reason?

Dr FRIEDMAN I would not in every case. I would keep most of them here and see that they are made free to gain by proper nutrition and hygiene. I feel that the fact that we do not see so much rheumatic infection in the well-to-do who can afford proper nutrition and hygiene would indicate that as a whole we can handle the problem here without sending them South. If they felt that they ought to go South I would tell them to go right ahead.

Dr JONES I do not agree. Rheumatic fever patients spending the winter months in a subtropical climate do improve faster than those remaining in this climate. Transportation is however not a panacea. If a patient be so economically situated it would be wise for him to go to a more ideal climate, but this should be done during the winter and spring months for five or six years. Few people are able to do this.

Dr MORSE There seem to be many questions about digitalis for Dr White to answer

Dr WHITE May I add a word about sending children South? A few years ago in Jamaica in talking with a capable doctor who had practiced actively there for thirty years I learned that he had never seen a case of rheumatic fever in a child that he had not encountered chorea and that he had never seen a case of valvular disease in a child except in a few rare congenital heart cases. Coming from there into southern Florida we conceived the idea of sending some children to Miami Beach which we did for five successive years (1930-35). We found that although these children were benefited they were not apparently benefited so much as they might have been in a more tropical climate such as exists in Jamaica.

I am quite convinced that if a family is riddled with rheumatic infection and rheumatic heart disease and that family can go to a tropical climate it should be sent there because there is no doubt of the benefit of a climatic change.

As to the question about digitalis it is asked whether there is danger from it in an acute rheumatic attack. I do not think there is any danger but I do believe the drug is often ineffective. I have not seen any harm come from the use of digitalis in these children and I have often seen it of some value. Once in a while when digitalis fails to control the heart rate in a young person with auricular fibrillation and active rheumatism it is worth while to resort to quinidine although that drug is not ordinarily indicated in serious heart disease and in fact is supposedly contraindicated. We have however saved at least one life and I think one or two others by its use in restoring normal rhythm.

As for the dosage of digitalis in children it should be relatively somewhat larger than the adult dose. It may be figured out at approximately 2/10 of a gram for each ten pounds of body weight. However one must individualize for each case.

Dr MORSE An attempt has been made in New York to desensitize children to rheumatism by intravenous injections of streptococcus products. What do you think about it, Dr Jones?

Dr JONES It would seem unjustifiable in view of the report of Wilson. In her series, there was no appreciable variation in the number of recurrences in three groups: 1. Patients desensitized or immunized with the intravenous injection of the best vaccines available. 2. A control group receiving typhoid vaccine intravenously. 3. An untreated group. In addition the patient is put through some very stirring episodes in the process of the treatments.

Dr MORSE I have a very good question here from the floor. By what criteria does the clinician determine when an active rheumatic process has become inactive? Dr Green.

Dr GREEN That is a difficult question. Close observation of the patient as to temperature and pulse rate, general condition of the patient and the response to bed rest are the chief criteria of improvement. Complications may arise early in the disease so that the quicker the diagnosis is made the better.

Dr JONES I am sorry to do so much of the talking but we have been impressed on occasion with the fact that active rheumatic fever may persist for long periods with but little evidence. This is demonstrated in the occasional patient coming to autopsy, in whom there has been little or no clinical or laboratory evidence of active rheumatic fever. We had one adolescent girl who for some time had been comparatively well. During the afternoon of a very hot day she suddenly had a chill and high fever without apparent cause and death resulted within several hours from pulmonary edema. Pathologically she showed extensive active rheumatic fever. I also recall a second patient dying within twenty-four hours of uncontrollable auricular fibrillation. Active rheumatic fever was also found postmortem.

Dr MORSE Just a word or two as to prognosis. Does recovery from rheumatism ever occur? That is, is susceptibility to infection ever overcome? Is the allergic condition ever overcome?

Dr WHITE It is certainly true that many adults coming into middle age are completely free from recurrences of acute rheumatism to which they were subject when they were children. In other words patients can make a good recovery from a tendency to rheumatic recurrence, even though acute attacks may rarely occur as late as sixty years of age.

Dr GREEN I think there can be recovery from rheumatic fever particularly in children. We have had children in our heart clinic who have had attacks of rheumatic fever in some cases with severe pericarditis who after being followed for ten years now show absolutely no evidence of rheumatic fever.

Dr JONES I agree. I do think that rheumatic fever can occur in a patient who may never have it again and who remains perfectly well. I also think that when we know the etiology and have a definite test for the disease, we will find that a greater percentage of the population has rheumatic fever than is now evident.

Dr FRIEDMAN I think they do definitely recover but I think the fact they have had it should make one watchful to see whether any recurrence or relapse can come later on.

Dr MORSE The next question I have is: Are lesions in the heart ever healed? Dr Mallory, I

think has practically answered that question. I can say for myself that I think they are. Recovery from rheumatic heart disease in childhood is entirely possible and does happen. If there is anybody who does not agree with me speak up.

Dr WHITE I do not disagree but I wish to add a word with reference to the interpretation of murmurs which very frequently have been wrongly judged. A systolic murmur at the apex is sometimes attributed to damage to the mitral valve when it is really due to the effect of left ventricular dilatation. Also, it is interesting to note that occasionally acute rheumatic changes in the heart are found, entirely unsuspected on postmortem examination of individuals dying of noncardiac deaths.

Dr MORSE I have a question here. In those children with acute follicular tonsillitis and concomitant joint pains without swelling and of short duration—should we treat them as rheumatics? I will ask Dr Stansfield to answer.

Dr STANSFIELD I do not see why we should. Practically every acute tonsillitis is going to have pretty definite discomfort around the joints as well as the muscles, and there is no reason to treat it as rheumatic fever.

Dr MORSE Do the rest agree? Apparently they do. Another question from the floor: How important is weight gain or loss in prognosis? We will let Dr Friedman answer that.

Dr FRIEDMAN I think it is very important because any gain in weight is direct evidence that the child is doing better and is overcoming the systemic infection. I think it is of very great importance in guiding us as to prognosis.

Dr MORSE The time is getting short, and we shall not get through all the subjects which I had intended to have discussed. I think we shall have to stop at this point. I had hoped to take up chorea but, as it is now approaching half past eleven, when we must adjourn, I will turn the meeting over to the Chairman.

CHAIRMAN HUNT We have one matter of business to attend to, namely, the election of officers for the ensuing year. The Nominating Committee presents the names of Dr James Herbert Young of Boston as Chairman, and Dr James M. Baty of Belmont as Secretary. Are there any other nominations from the floor? If not, what is your pleasure? It is moved and seconded that the Secretary cast one ballot for the slate as nominated. Those in favor will say Aye, those opposed No. It is a vote. The Secretary has cast his ballot as directed and you have elected Dr J. Herbert Young of Boston as Chairman of the Section for the ensuing year and Dr James M. Baty of Belmont as Secretary.

In behalf of the Section and expressing my own gratification, I feel that this has been an outstanding Section meeting of this Annual Meeting of the Society. I know that without any question those of us who have been at other meetings during the past three days have noticed more questions coming to the platform and we have had much more discussion and more general interest from a great many men who would not get up on their feet come to the microphone, and ask questions. And, on behalf of the Section and myself personally I want to thank our galaxy of stars here—Dr Morse, Dr Friedman, Dr Green, Dr Jones, Dr Mallory, Dr Stansfield, and Dr White—for their interesting discourses. I think they have given us an outstanding demonstration in rheumatism which affects the practice of every one of us almost daily. In behalf of the Section I will ask for a rising vote of thanks to these gentlemen.

The meeting is now adjourned.  
[Adjourned at 11:30 a.m.]



## STUDIES IN ASTHMA\*

## XIX The Nose and Throat In Five Hundred Cases of Asthma

BY FRANCIS L. WEILLE, M.D.

IN the Anaphylaxis Clinic of the Massachusetts General Hospital a special study has been made of the nose and throat in asthma. Five hundred patients with asthma have been examined and treated and have been followed, in the great majority of cases for a considerable length of time. Four hundred have been followed from six months to six years, three hundred and sixty-six for one or more years, and two hundred and seven for three years or longer.

The patients examined and treated were not segregated from the remainder of the Anaphylaxis Clinic; the attention given the nose and throat was made a part of the patient's treatment, but not all of it. Major emphasis was placed upon the nose and throat therapy in some cases and in others such therapy constituted the sole treatment. The diagnosis and treatment of the cases was spread over a period of several years and an earnest effort was made to give all patients an adequate amount of time and effort in the solution of their problems.

Classification of the facts observed was accomplished by transferring the interesting points regarding each patient to a card system. These facts were then coded and tabulated by means of a business statistical machine owned and operated by the Harvard Medical School in its School of Public Health. This method not only discovers inaccuracies but lends itself toward ease in permitting corrections. The method may be recommended for its relative simplicity and for its flexibility in permitting further study of the same group at a later date. By means of the method employed it is possible to review five hundred and forty facts concerning each of the five hundred cases and to evaluate any desired observation in terms of any other observation included in the code.

It is said that statistics can prove anything. In the present study no effort was made to prove anything save the truth. The facts were observed and tabulated, then conclusions were drawn. The converse method was not employed.

The patients are classified according to age in chart 1. Almost one half were between thirty and fifty years. So few children of ten years

or less were included that deductions regarding them are worthless. As regards the kind of asthma two hundred and forty had extrinsic asthma, two hundred and fifty-five had intrinsic asthma and five had miscellaneous diagnoses—"unclassified", "chronic bronchitis and emphysema" and so forth. The methods em-

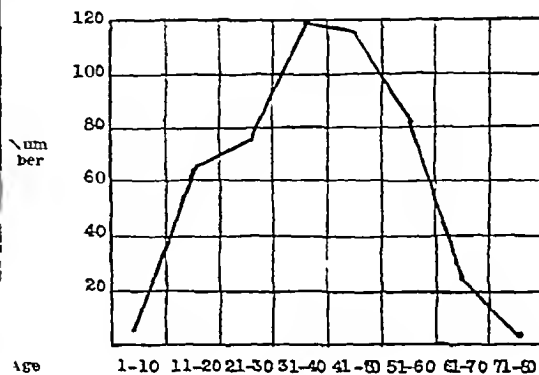


CHART 1  
Classification of Cases According to Age

ploved in arriving at such diagnoses were similar to those employed in other reported studies in asthma from the Anaphylaxis Clinic<sup>1</sup> of the Massachusetts General Hospital.

The more important nose and throat lesions in the group are presented in chart 2, these

CHART 2				
NOSE AND THROAT LESIONS				
Lesions	Total	Extrinsic	Intrinsic	Miscellaneous
Pansinusitis (unilateral or bilateral)	46	11	34	1
Sinusitis—one or more (unilateral or bilateral)	316	136	180	0
Vasomotor rhinitis	223	111	109	3
Polypi	211	81	128	2
Surgically deviated septum	95	47	46	2
Severe chronic tonsillitis	35	15	20	0
Abscessed teeth	84	41	43	0

are simultaneously classified according to the kind of asthma. Pansinusitis is three times more common in intrinsic than in extrinsic asthma; less extensive sinusitis is, however, only a third more common. Nasal polypi were seen two thirds more often in intrinsic than in extrinsic asthma. The quick assumption that each polyp and the associated sinusitis alone

<sup>1</sup>Presented as a candidate's thesis to the American Laryngological, Rhinological and Otolaryngological Society.

The expenses of this investigation were met from an anonymous donation known as the M. G. H. Asthma Fund.

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"cause" asthma may be an easy fallacy in judging an incompletely studied patient. Septal deviations of severe degree are about equally distributed between the extrinsic and intrinsic cases. The problem of diseased teeth and tonsils is dealt with elsewhere.

Unstable nasal mucous membrane associated with vasomotor rhinitis or simulating this condition was observed in two hundred and twenty-three patients, almost equally in extrinsic and intrinsic asthma. One hundred and fifty-four cases complained of a thin watery nasal discharge while one hundred and thirty-two patients were distressed by severe sneezing. The commonness of mucous membrane instability in the nose suggests that similar path-

by Proetz.<sup>2</sup> The importance of such sinusitis lies in the fact that, when patients so affected have acute upper respiratory infections, the sinuses frequently become worse and their tendency is to keep the asthma going. Moreover, chronically thickened sinus membranes may become worse spontaneously and become polypoid and purulent. Regardless of cause and effect in relation to asthma, such degenerative changes place a further burden upon the patient's general health.

Severe sinusitis in the group studied was most frequently seen as a purulent antrum or as ethmoiditis with polypoid degeneration. Conversely, the polypoid antrum or purulent ethmoid has been less commonly observed. Com-

CHART 3

## RESULTS ON ASTHMA

Treatment	Total	Extrinsic Asthma				Intrinsic Asthma			
		Cured	Better	Same	Worse	Cured	Better	Same	Worse
No operation	290								
Intranasal antrum (one or both)	17	1	4	0	0	1	7	2	2
Radical antrum (one or both)	41	1	3	3	0	3	18	10	3
Intranasal ethmoid (one or both)	30	1	1	1	0	2	17	6	2
External ethmoid (one or both)	5	0	0	1	0	0	1	2	1
Sphenoids and external frontals (one or both)	7	0	0	1	0	1	4	1	0
Tonsillectomies	36	1	11	3	0	0	13	6	2
Cases having extraction of abscessed teeth	59	1	14	5	3	2	22	7	5
		Extrinsic	five			Intrinsic	twelve		
		Extrinsic	seven			Intrinsic	thirty four		
		Extrinsic	three			Intrinsic	twenty seven		
		Extrinsic	one			Intrinsic	four		
		Extrinsic	one			Intrinsic	six		
		Extrinsic	fifteen			Intrinsic	twenty one		
		Extrinsic	twenty three			Intrinsic	thirty six		

ology may be present in the tracheobronchial tree and be an important factor in precipitating the asthmatic attack. This point was made in a previous report on the basis of bronchoscopic observations.<sup>2</sup>

The frequency of sinusitis, as seen in three hundred and sixty-two of the five hundred cases, is striking. This observation should serve to make the rhinologist "allergy-minded" and the allergist "sinus-minded." It should be pointed out that many of the three hundred and sixty-two patients did not have severe sinusitis, merely a thickened membrane in the sinuses was extremely common, especially in the antrums and ethmoids. Two hundred and sixty of the patients had thickened membrane in at least one antrum though some of the same patients had more severe sinusitis elsewhere. The hypothesis that thickened sinus mucous membrane is merely a part of the asthma and not the cause of it appears to be a reasonable one in view of mucous membrane instability observed throughout the respiratory tract in asthma and the probable labile character of such sinusitis at least occasionally as reported

by Proetz.<sup>2</sup> The importance of such sinusitis lies in the fact that, when patients so affected have acute upper respiratory infections, the sinuses frequently become worse and their tendency is to keep the asthma going. Moreover, chronically thickened sinus membranes may become worse spontaneously and become polypoid and purulent. Regardless of cause and effect in relation to asthma, such degenerative changes place a further burden upon the patient's general health.

Severe sinusitis in the group studied was most frequently seen as a purulent antrum or as ethmoiditis with polypoid degeneration. Conversely, the polypoid antrum or purulent ethmoid has been less commonly observed. Com-

	Antrum (one or both)	Ethmoid (one or both)	Frontal (one or both)	Sphenoid (one or both)
Purulent sinusitis	62	30	11	9
Polypoid degeneration	31	45	17	17

The surgical treatment employed with the end result evaluated in terms of asthma and its kind is summarized in chart 3. The principles utilized in the selection of cases for sinus surgery have been discussed in a previous report.<sup>4</sup> From the figures seen in the chart it will be observed that two thirds (66 per cent) of all sinus operations resulted in more or less improvement in the asthma and that such improvement was about the same whether the asthma was intrinsic or extrinsic. It will be observed that a higher percentage of improvement in asthma followed conservative nasal surgery

rather than very drastic efforts, such as external ethmoidectomy

The local results are summarized in chart 4. In general it may be said that results in the nose were satisfactory and were accomplished by means of relatively conservative surgery.

#### THE TONSILS IN ASTHMA

Two hundred and fifty-nine of the five hundred patients had normal tonsils. One hundred and eighty-six had chronic tonsillitis but only thirty-five of these patients had severe chronic tonsillitis. One hundred and nineteen members of the group had had a previous tonsillectomy, unfortunately numerous patients in

Asthma	Intrinsic	Extrinsic	Total
Cured	2	1	3
Better	22	14	36
Same	7	5	12
Worse	5	3	8

It will be observed that thirty-nine of the patients were improved or cured whereas twenty were the same or worse. This ratio is about two to one and is the same whether the asthma is intrinsic or extrinsic.

#### BRONCHOSCOPY IN ASTHMA

A group of thirty-six patients may be mentioned as having had bronchoscopy as a part of their treatment. The principles of selection

CHART 4

#### RESULTS IN NOSE

Treatment	Total	Extrinsic Asthma				Intrinsic Asthma				Unknown
		Cured	Better	Same	Worse	Cured	Better	Same	Worse	
No operation	290									
Intranasal antrum (one or both)	16	1	4	0	0	0	11	0	0	
			Total of five				Total of eleven			
Radical antrum (one or both)	35	0	3	0	0	2	24	3	3	
			Total of three				Total of thirty-two			
Intranasal ethmoid (one or both)	30	1	3	0	0	2	20	2	2	
			Total of four				Total of twenty-six			
External radical ethmoid (one or both)	5	0	0	0	2	0	3	0	0	
			Total of two				Total of three			
Frontals and sphenoids (one or both)	7	0	0	0	1	0	4	0	2	
			Total of one				Total of six			

this group had more or less troublesome tonsil remnants.

Tonsillectomy was advised and carried out in fifteen of the thirty-five severe cases and in twenty other patients. While this procedure was advised also in many additional instances numerous patients were allowed to retain infected tonsils. Twenty-five members of the group undergoing operation showed improvement but only one case was cured. Three additional patients were temporarily cured, but later became the same as before operation. In four cases the asthma was the same as before operation and in two patients it became worse.

These figures suggest that while some degree of improvement occurs in the asthma in a relatively high percentage of selected tonsillectomized cases cure is rare.

#### THE TEETH IN ASTHMA

One hundred and thirty-three members of the total group of five hundred had x-ray films of the teeth. In every such case films of all the teeth were taken. In only eighty-four patients were abscessed teeth discovered and of these only fifty-nine had the abscessed teeth extracted. The following table summarizes the results in the asthma.

Of these cases have been described in a previous report<sup>2</sup> which included fifteen members of the group. Twelve of the patients were improved and three were cured. Six were temporarily cured but later were the same as before treatment. The remaining cases were not benefited. During the period of observation nine patients died five from asthma and the remainder from other causes. The high mortality in this group emphasizes the severity of the disease dealt with. A dramatic contrast was seen in two patients both of whom appeared moribund in an asthmatic attack. One was saved from drowning in her own viscous secretions by bronchoscopic aspiration of the tracheobronchial tree whereas the other died when only intense congestion of the mucous membrane with little secretion was found at operation.

The commonness of mucous membrane instability in the tracheobronchial tree in the group is striking and suggests itself as a factor in the production of asthmatic attacks. Such instability is more striking to the observer in the living patient than the hypertrophy of the smooth muscle of the bronchioles in the post-mortem examination of the lung. The response of such mucous membrane to topical drug therapy varies somewhat after the fashion of unstable nasal mucous membrane.

An attempt to stabilize the bronchial mucous membrane by diathermy desiccation in one case was unsuccessful

THE NONSURGICAL GROUP

It is interesting to observe the results in the asthma in a group of cases having no form of surgical treatment—whether drainage of sinuses, bronchoscopy, removal of polyps, teeth tonsils and so forth. Two hundred and ninety of the five hundred patients constitute this group. One hundred and forty-two of these cases had slight to severe degrees of sinusitis, fifteen had pansinusitis. One hundred and forty-eight had clinically normal sinuses, confirmed by the x-ray examination in eighty-seven instances.

One hundred and sixty-four of the patients had normal tonsils, whereas forty-five had no tonsils and eighty-one had infected tonsils. Of the latter, twenty had severely infected tonsils. Forty-nine members of this group had normal teeth by x-ray examination, whereas twenty-five patients had abscessed teeth which were recognized by the same method, but which were untreated.

Chart 5 is a summary of the results in the

In certain cases a recurrent postnasal discharge has been associated with the onset of productive cough and wheezing, symptomatic relief from the postnasal discharge in these cases has accompanied relief from the asthma.

SUMMARY AND CONCLUSIONS

- 1 Facts not theories have been reported
- 2 Patients should remain free of asthma for at least three years before being reported in the literature as cured
- 3 Patients with intrinsic or extrinsic asthma may be improved or cured of asthma even though retaining a severe degree of sinusitis, infected tonsils or abscessed teeth. A focus may be present in extrinsic asthma without causative relationship to the asthma save by making the general condition of the patient worse
- 4 Occasional cures of extrinsic asthma may result from the removal of an allergen whereas the patient ascribes the improvement to some form of nasal treatment
- 5 If asthma is a disease of the parasympathetic nervous system, this may explain why some

CHART 5

Treatment	Total	RESULTS IN ASTHMA							
		Extrinsic Asthma				Intrinsic Asthma Unknown			
		Cured	Better	Same	Worse	Cured	Better	Same	Worse
No operation	290	14	94	36	9	8	52	37	5
		Extrinsic 153 cases				Intrinsic 102 cases 35			

asthma in the two hundred and ninety patients. About two thirds were improved or cured, the remainder were the same or worse. Since some members of the group had little or no pathology in the nose, throat or teeth, these figures do not make a fair comparison with the groups of patients treated surgically. It is to be emphasized that numerous cases included in the two hundred and ninety patients just described were directed to have more or less drastic treatment but failed to carry out such advice.

MISCELLANEOUS OBSERVATIONS

Occasional patients included in the present study have complained that the asthma followed a nose or throat operation, such as tonsillectomy, submucous resection of the septum or some form of sinus drainage. It is interesting to contrast such cases with those who attribute improvement or cure of the asthma to similar surgical procedures. Not infrequently patients have been observed who ascribe improvement in well defined extrinsic asthma to some form of nose and throat therapy, whereas medical opinion has explained the benefit as due to immunization against or removal of an allergen.

patients develop asthma after nose and throat operations and why others lose their asthma after similar operations.

- 6 Mucous membrane instability is seen throughout the respiratory tract in many asthma patients. Such instability in the tracheobronchial tree resembles strikingly that seen in the nose in two hundred and twenty-three of five hundred patients. Such instability in the tracheobronchial tree is a part of asthma, in the nose it is a part of the same underlying condition.
- 7 The fact that various methods of treatment produce nearly uniform results—two thirds better or cured, one third same or worse—suggests a spontaneous tendency toward remissions in asthma.
- 8 The frequent occurrence of sinusitis in allergic patients should make rhinologists “allergy-minded” and allergists “sinus-minded.”
- 9 Conservatism in the selection of patients and in the choice of operative procedure is desirable in dealing with sinusitis in asthma.

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## FACTORS INFLUENCING THE DEVELOPMENT OF TUBERCULOUS INFECTION IN CHILDHOOD

BY ALLEN S. JOHNSON, M.D.\*

THIS study was undertaken in an attempt to evaluate some of the factors supposed to influence the development of tuberculous infection in children. The group in question comprised 375 children under sixteen years of age who were examined at the Health Department Tuberculosis Dispensary in Springfield. Two hundred and eighteen children gave a definite history of contact with a known case of pulmonary tuberculosis, 157 noncontacts were present for examination because of malnutrition

1930-31 about 25 per cent were found to be reactors.<sup>2</sup> As this includes some contacts, the incidence among noncontacts in the population at large is obviously lower. In table 1 it will be seen that only 21 per cent of the children who had never been exposed to a recognized case of tuberculosis showed a positive skin reaction whereas 57 per cent of all the contact children and 63 per cent of those exposed to positive sputa had positive skin reactions.

The sex of the child appeared to have little

TABLE 1

RELATION OF EXPOSURE TO THE DEVELOPMENT OF TUBERCULOUS INFECTION IN CHILDREN

	Total Contacts	Contacts from Homes with Positive Sputa	Noncontacts
	218 (109 M) (109 F)	158	157 (68 M) (89 F)
Positive Tuberculin (cutaneous)	125 (60 M) (65 F)	100 (47 M) (53 F)	33 (17 M) (16 F)
Percentage	57.3	63	21
Positive Tuberculin Positive X Ray (hilum shadows)	49 (24 M) (25 F)	36 (20 M) (16 F)	12 (6 M) (6 F)
Percentage	22.4	27.7	7.6

recurrent respiratory infections, or vague apprehension on the part of the parent. The examination of each child included a record of the age, sex, height, weight, temperature, cutaneous tuberculin reaction after forty-eight hours, x-ray of the chest, source of contact, period of exposure, and an appraisal of domestic hygiene as a result of personal investigation of the home.

The importance of exposure is well known. Opie<sup>3</sup> states that approximately 80 per cent of children of households in contact with persons having positive sputa had acquired infection within the first five years of life, whereas of households in contact with a consumptive with a persistently negative sputum only 30 per cent are infected. Of approximately 48,000 grade school children examined in Massachusetts in

bearing on the susceptibility to tuberculous infection as has been pointed out by Amberson et al.<sup>3</sup> The slightly higher incidence of positive tuberculin reactions among the girls in this study is of little significance in view of the small series investigated.

It has been generally assumed that a tuberculous mother constitutes a greater risk to the child than an infected father because of her closer association with the offspring. Contrary to our expectation it was found that 70 per cent of the children exposed to a tuberculous father had positive reactions, whereas only 53 per cent of those with a tuberculous mother gave such a reaction (table 2). When a sibling or other relative living under the same roof was the source of contact, only 38 per cent of the exposed children had positive skin reactions. This was not due simply to the fact that more fathers than mothers might have had pos-

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itive sputa as the same general relationship obtained when contact with cases of open tuberculosis were studied

In table 3 an attempt was made to determine

TABLE 2  
RELATION OF SOURCE OF INFECTION TO  
TUBERCULOUS INFECTION

	To Father	To Father Having Positive Sputum	To Mother	To Mother Having Positive Sputum	To Siblings	To Siblings Having Positive Sputum
Number of Children Exposed	90	68	86	62	42	28
Positive Tuberculin	63	52	46	35	16	13
Percentage	70	76.5	53.5	56.5	38	46.6

in which five year period of its first fifteen years a child was the most vulnerable from the standpoint of tuberculous infection. The cases were divided according to the five-year period during which the maximum exposure occurred. There was necessarily some overlapping but our detailed knowledge of the past history of the infected parent, who had almost always

TABLE 3  
RELATION OF THE PERIOD OF MAXIMUM EXPOSURE TO  
THE DEVELOPMENT OF TUBERCULOUS INFECTION

Ago Period of Maximum Exposure	Total Cases	Exposed to Positive Sputum	Positive Tuberculin	Exposed to Positive Sputum and Having a Positive Tuberculin	Percentage
0-6 years	112		60		53.5
		80		47	58.7
6-11 years	58		36		62.0
		44		30	68.0
11-16 years	48		29		61.5
		34		23	67.5

been cared for in our clinic or hospital, enabled us to make certain generalizations. The contact children who had been exposed chiefly during the first five years of life did not show the highest incidence of positive skin reactions. The second and third five-year periods appeared to be distinctly more vulnerable and this same relationship held for exposure, both to all cases diagnosed as tuberculous by x-ray or sputum and to those actually having a positive sputum

On the other hand, of all the contact children having positive skin reactions the highest percentage was found to have received maximum exposure during the first five years of life (table 3a). This does not invalidate the

TABLE 3a

Contact Children with Positive Tuberculin	Maximum Exposure	Per Cent	Maximum Exposure	Per Cent	Maximum Exposure	Per Cent
	0-6 years		6-11 years		11-16 years	
125	60	48	36	28.8	29	23.2
With Negative Tuberculin						
93	50	53.8	23	24.7	20	21.5

foregoing conclusion concerning the most dangerous time to be exposed, as the majority of contact children with negative reactions also experienced their maximum exposure during this same period. Adult pulmonary tuberculosis is a disease of early adult life during which period in the lives of their parents most children are born. Obviously, children born into a home where tuberculosis exists will receive their maximum exposure during their first five years. Subsequently the parent is likely either to grow worse and leave home for a sanatorium or a cemetery, or to recover. In either case the contact is broken so that exposure of the child is unlikely to continue much more than five years.

The older the child, the greater the chance of his having a positive reaction because his mere existence, irrespective of known exposure to tuberculous infection, increases his opportunities for contact with stray tubercle bacilli. In 1910 Hamburger<sup>4</sup> showed that the percentage of positive reactors to the von Pirquet rose from 9 per cent at two years to 94 per cent at fourteen years. Opie<sup>5</sup> nearly twenty years later reported the results of intracutaneous tuberculin tests on 4000 school children. Thirty-seven per cent were infected at five years, 71 per cent at ten years, 80 per cent at fifteen years. Of 48,000 Massachusetts school children on whom the von Pirquet test was done in 1930-31 20 per cent gave positive reactions at five years and 34.6 per cent at fifteen years. A similar progressive increase in the incidence of positive tuberculin reactions in ascending age groups is seen in table 4 where they are also classified as contact and noncontact cases.

In table 5 is shown the relation between the

duration of exposure and the incidence of infection as indicated by a positive skin reaction. As might be expected, the longer the exposure, the greater the chance of infection. The fact that the children exposed four years or more did not show a higher incidence of infection than those exposed for two years may be due to the

TABLE 4

RELATION OF THE INCIDENCE OF TUBERCULOUS INFECTION TO THE AGE OF THE CHILDREN EXPOSED

Age Group	Total Cases	Positive Tuberculin Reactions	Per Cent
0-6 years	84	21	25
Contacts	50	19	38
Noncontacts	34	2	5.9
6-11 years	137	52	38
Contacts	76	44	58
Noncontacts	61	8	13
11-16 years	154	85	55
Contacts	92	63	68.5
Noncontacts	62	22	35.5

fact that many of the sources of contagion in the former group were old inactive cases that probably constituted a real danger during only a small part of the time in which the child was actually exposed. The sicker cases with the more active infection usually went away to a sanatorium or died within a year or two after the diagnosis was made, so that the contact was broken sooner than in the case of the chronic but relatively inactive patient.

TABLE 5

RELATION OF THE DURATION OF EXPOSURE TO THE INCIDENCE OF POSITIVE TUBERCULIN REACTIONS

Years of Exposure	Number of Cases	Positive Tuberculin Reactions	Per Cent
1	118	55	46.5
2	33	25	75.7
3	18	12	66.5
4 or more	34	24	70.5

Tuberculosis has long been recognized as a disease of social and economic destitution. In table 6 is recorded our attempt to determine whether a child exposed to tuberculosis in an unhygienic environment ran a greater risk of infection than a child more fortunately situated. Class A homes implied neatness, cleanliness, a fair amount of sunlight and fresh air and reasonable intelligence with evidence of hygienic consciousness on the part of the inmates. Class C homes were dirty, poorly situated, and inhabited by stupid or irresponsible people. Class B was intermediate between the two. The incidence of positive reactions among the non-contact children was similar in all three classes. This is to be expected since poor domestic

hygiene would not materially increase the danger of tuberculous infection in a home free of tuberculosis. On the other hand we were surprised to find that the contact children from Class A homes had almost as high an incidence of positive reactions as those from Class C homes. One cannot conclude from this that good hygiene is unimportant. But it may be that other contributory factors, not fully recognized, exert a great deal of the influence usually attributed to domestic hygiene *per se*. This is in accord with the conclusions of Amberson et al.<sup>3</sup> that so far as general characteristics were concerned no one age, sex, social or economic group could be identified to include the greater

TABLE 6

RELATION OF DOMESTIC HYGIENE TO THE INCIDENCE OF TUBERCULOUS INFECTION

Domestic Hygiene	Number of Cases	Positive Tuberculin Reactions	Per Cent
A	Contact	110	65
	Noncontact	75	15
	Total	185	43.2
B	Contact	55	26
	Noncontact	44	11
	Total	99	37.4
C	Contact	53	34
	Noncontact	38	7
	Total	91	45

portion of infection and that general health conditions were not illuminating so far as the chances of positive reactions were concerned.

The latter cherishes a belief that malnutrition predisposes a child to tuberculous infection. Amberson et al.<sup>3</sup> however, have shown in a study of 1000 school children that only about 12 per cent of those infected were 10 per cent or more underweight. In table 7 it will be seen that 23

TABLE 7

RELATION BETWEEN STATE OF CHILD'S NUTRITION AND TUBERCULOUS INFECTION

	Number of Cases 10 Per Cent or More Underweight	Positive Tuberculin	
		Number of Cases 10 Per Cent or More Underweight	Per Cent
Contact	38	24	63
Noncontact	55	13	23.3
Total	93	37	39.8
Positive Tuberculin			
Contact	125	24	19.4
Noncontact	33	13	39.4
Total	158	37	23.4

per cent of the positive reactions were underweight and nearly 40 per cent of the underweight children had positive reactions. The higher figures here are probably due to the fact that our clinic was dealing with underprivileged children whom one might expect to be poorly nourished. As a matter of fact approximately 25 per cent of all the children examined in the clinic and about 26 per cent of the negative reactions were 10 per cent or more underweight, using the Baldwin-Wood age, height, and weight tables as a standard.

This is admittedly a small group of children from which to draw conclusions. But this very feature has enabled us to study each child and his environment, as well as his source of contagion, in greater detail than is possible in large surveys dealing with thousands of cases. In order to check the possible errors due to the size of the group, a preliminary appraisal of the data was made halfway through the study. The same conclusions appeared warranted then as were reached after another 175 children had been examined a year later. Although this constancy of data may give one the temerity to draw conclusions it obviously lacks the support which a larger series would give.

## SUMMARY

Close and persistent association with a case of pulmonary tuberculosis especially one with a positive sputum, appears to be the most important predisposing factor in the development of tuberculous infection in children. It has not been possible to demonstrate that the age, sex or nutrition of the child, the source of contagion, or the sanitary conditions in the home play an important part in conditioning tuberculous infection in the child.

Grateful acknowledgment is due to Miss Mary Carmody R.N. and Mrs. Adelaide Perry, the clinic social workers, whose careful tracing of contact cases has made this study possible.

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## MEDICAL PROGRESS

## PROGRESS IN THE TREATMENT AND DIAGNOSIS OF SYPHILIS, 1935

BY AUSTIN W. CHEEVER, M.D.\*

**D**URING the year 1935, nothing really new has been written regarding syphilis, though many excellent articles have been published. The general trend seems to be toward a study of the incidence, distribution and prognosis of the disease with the hope of arriving at a better understanding of the problem. Of the drugs at our disposal mapharsen, which is the newest, is beginning to receive attention. This year also saw the best means of instructing the public, which heretofore had been closed to the mention of syphilis and gonorrhea, opened to instructive articles on these subjects. Several broadcasting stations, several good lay magazines, and some newspapers have laid aside their objections and it is hoped that more will follow suit.

Dublin<sup>1</sup> of the Metropolitan Life Insurance Company comments on the general trend of syphilis which he finds definitely downward in the white population in this country during the last two decades while among the colored people the opposite is true. He urges greater con-

centration of attention to the syphilitic Negro population.

Chadwick,<sup>2</sup> Commissioner of Public Health of Massachusetts, reports from the prenatal clinics of Boston 119 per cent definitely positive and 199 per cent of positive and doubtful Hinton blood tests in the pregnant women. These are compared with Hinton's<sup>3</sup> 803 per cent positive and doubtful (less delicate Wassermanns) in 1923.

Nabarro<sup>4</sup> finds the incidence of congenital syphilis in England decreasing materially. The number of infants under one year of age has decreased one half, older children less. He emphasizes that, if syphilis were properly detected and treated in the expectant mother, congenital syphilis would be almost a thing of the past.

Cook<sup>5</sup> reports that in the United States Navy from 1914 to 1933 syphilis cases increased (in round numbers) from twenty to twenty-four per thousand, gonorrhea decreased from eighty-five to sixty-six per thousand and chancroid decreased from forty-three to twelve per thousand. (A more delicate test for syphilis was

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used during the later part of this time, thus detecting more cases.) Usilton<sup>a</sup> by the one-day census method has made various estimates regarding syphilis and gonorrhea in the United States. The incidence is shown to be higher in the smaller cities than in the larger. About 493 000 patients are estimated to be constantly under treatment for syphilis in the United States. The incidence of fresh infections per year seems to be four per thousand for syphilis and eight per thousand for gonorrhea. The highest attack rate occurs between the ages of sixteen and thirty. The trend of syphilis seems to be upward with, however, a decrease in the prevalence rate for early syphilis while the number of cases of gonorrhea actually under treatment has decreased but it is believed that this is caused by neglect of treatment because of economic depression rather than an actual decrease in the number of infections. The Chief Medical Officer<sup>c</sup> of the Ministry of Health for England and Wales reports a continual decrease in syphilis while gonorrhea shows no evidence of decline.

Denmark shows a decrease of fresh infections from 4500 in 1919 to 700 in 1933. Lomholt<sup>s</sup> attributes these good results to an effective organization to combat syphilis as well as to effective treatment. The chief points are the following: (1) free treatment—about 70 per cent of these patients are treated by specialists who are paid by the city or the state, (2) compulsory treatment, and (3) punishment for knowingly infecting others with syphilis or gonorrhea. Yugoslavia<sup>9</sup> has recently enacted a law regarding the control of syphilis and gonorrhea. Among other provisions it provides for the establishing of homes for unemployed women and girls. Institutions are also to be established for delinquent girls and for women who have been arrested for prostitution in an effort to restore them to a normal life.

Verano<sup>10</sup> et al report of the activities of the Argentine League for Social Prophylaxis, the first of its kind in South America. They have been carrying on an active educational campaign. During the three years that this clinic has been functioning about 70 per cent of the male candidates for marriage who have come for examination have had contagious stages of either syphilis or gonorrhea. The treatment of these patients has prevented a great amount of sickness and disability which otherwise would have occurred in their families. They are working toward a law requiring prenuptial examination.

An editorial<sup>11</sup> in the *Venereal Disease Information* comments sharply on the neglect of providing for the financing of venereal disease programs in a group of representative cities in the United States. It shows that expenditures for the control of communicable diseases

amounted to 52.92 cents per capita in 1933 but for venereal control only 2.78 cents. The problem of syphilis and gonorrhea in the United States is a very complex one, and the solution of it will prove expensive. Unless health departments are more generous, but little can be expected in the campaign against syphilis and gonorrhea.

Gray and Cleveland<sup>12</sup> report two small epidemics of syphilis. One started in a seventeen-year old girl who gave it to three younger children, to two by sharing her gum with them and to the nursing by giving him food she had chewed. The mother subsequently developed a primary lesion of the nipple and in turn passed it to the father. The second group started with a father who had a primary lesion of the chin gave it to his wife and she apparently transmitted it to their three-year old child by feeding it food which she had masticated.

Morgan<sup>13</sup> reports sixteen cases of syphilis acquired through blood transfusions. There was no instance in which the donor had latent or chronic syphilis. He notes that many donors with chronic syphilis have failed to transmit the disease. Jones, Rathmell, and Wagner<sup>14</sup> review the literature on transfusional syphilis and report four additional cases. They urge greater care in excluding early syphilis in transfusion donors.

It has long been realized that the female with early syphilis may be rendered perfectly safe to a mate by two or three weeks of treatment which will heal the open lesions, thereafter she remains safe if treatment is satisfactorily carried out. We have not known when the male becomes safe, nor do we yet, but a little light has been thrown on the problem by Greenbaum, Katz, and Rule<sup>15</sup> who injected the semen from twenty-five patients (five with acute and twenty with chronic syphilis) who had had some treatment for several weeks or months previous to the test, into the testicles of rabbits. After three months' observation, the inguinal lymph nodes were removed from the rabbits, ground up and injected into the testicles of other rabbits. At the end of three months these rabbits showed no macroscopic evidences of syphilis and no spirochetes were found in material from the inoculated testicles by darkfield examination. This study demonstrates that we have had an exaggerated idea of the infectiousness of the semen of patients under treatment for syphilis and suggests a method of testing infectiousness that might be used before contemplated marriage in conjunction with the usual methods of examination.

Ballotta<sup>16</sup> feels that the only way to combat syphilis and gonorrhea effectively is to remove the stigma as far as possible and to induce the patient to report freely for treatment. He advocates having syphilis and gonorrhea consid-

ered as on the same footing with those diseases without moral implications. He urges that sickness insurance be applied to these diseases just as to any other contagious ones.

Sprague and White<sup>17</sup> find that there is a decrease in the incidence of aneurysm of the aorta from practically 0.2 per cent among the 52,000 patients admitted to the Massachusetts General Hospital between 1900 and 1909 to 0.03 per cent of the 75,000 patients in a similar ten year period ending in 1934, and this, in spite of the improved x-ray facilities for diagnosis in the later period. Kampmeier<sup>18</sup> emphasizes the point, not always recognized, that race in itself is probably not a factor in the greater proportion of aneurysm in the black race, as compared with the white, but that the proportion of laborers is greater among the black.

Previously the work of Hinton and Berk<sup>19</sup> was reported showing that when the blood Hinton test is negative, the spinal fluid is almost certain to be negative. They found, however, 2 per cent doubtful positive spinal fluid tests in their series. Grund<sup>20</sup> reports four cases of positive spinal fluid with negative blood Hintons. Epstein<sup>21</sup> out of a large group of cases of central nervous system syphilis reports a few cases with positive spinal fluid findings and negative blood Hintons.

Menninger and Bromberg<sup>2</sup> from a study of all types of central nervous system syphilis find that about 30 per cent show a negative Wassermann reaction, whereas in 23 per cent neither the blood Kahn nor Wassermann was positive.

Beinger<sup>22</sup> reports in considerable detail an investigation carried out by a Russian-German expedition to Buriat-Mongolia to study the question of the course of syphilis in primitive people who have had little or no treatment. They wished particularly to investigate Wilmann's theory that neurosyphilis is a result of treatment. They feel that they have demonstrated that general paresis and tabes occur among primitive and untreated people and that modern treatment is not responsible for the development of neurosyphilis.

Hall<sup>1</sup> from a study of 191 cases of central nervous system syphilis finds that modern treatment shortens the period between infection and development of all types of late syphilis, when the late syphilis because of inadequate treatment does develop. Wile, Poth, and Barney<sup>23</sup> report a study with reference to precocious development of central nervous system syphilis. Patients admitted to the University of Michigan Medical School Clinic from July, 1925 to July, 1933 form the material upon which this study is based. The absence or inadequacy of treatment was a predominant factor in the precocious development of both dementia paralytica and tabes.

Goodman and Moore<sup>24</sup> carefully studied two groups of neurosyphilitic patients: those whose spinal fluid had become negative and those remaining positive. While they found some relationship between the reaction and the outcome, they found that the persistently positive reaction of the spinal fluid is not conclusive evidence of the subsequent progression of the condition, nor can the reversal of the reaction be used as the sole guide to the optimum duration of treatment.

Menninger<sup>25-28</sup> has covered every phase of juvenile paresis in a series of articles appearing in several journals, with extensive bibliography.

Solomon and Epstein<sup>29</sup> review the results of treatment with triyparsamide of eighty-one patients with dementia paralytica. Each had more than ten injections. Three of them were given more than 250. Of the eighty-one patients thirty-four were classed as arrested, that is, able to return to and continue their work. A completely normal spinal fluid was found in 37.5 per cent of the cases.

Tylecote<sup>30</sup> points out that in tabes dorsalis disability results chiefly from changes affecting the eyesight and the locomotion. The outlook depends very largely upon early diagnosis and adequate treatment. Much depends upon the intelligent interpretation of a suggestive sign or symptom—shooting pains, a perforating ulcer under one great toe, difficulty in beginning urination, cystitis, the sudden appearance of a squint, and sluggish or unequal pupils. A diagnosis of tabes must not be made, however, without verification. Ankle jerks are always lost before knee jerks, and if they are retained the apparent absence of knee jerks need not cause alarm. In the preataxic stage, reeducation may work wonders in preventing the onset of ataxia. The prevention of urinary infection is most important. When the patient complains of discomfort regular tests of the urine and examination for retention must be made. A negative blood Wassermann is valueless in ruling out tabes dorsalis.

Belgrade and Wright<sup>31</sup> feel that in experienced hands the cisternal puncture, because of its lack of after effects, is preferable to the lumbar puncture. Fluid is seldom contaminated with blood. Hospitalization is not necessary but it should not be undertaken without thorough preliminary study and practice on the cadaver. Cisternal puncture should not be attempted in elderly patients because of the added danger of injuring tortuous blood vessels or in children mainly because in them lumbar puncture is fairly easy and free from after effects. Wilde<sup>32</sup> recommends cisternal puncture as a regular office procedure.

Under the title of "A New Syphilitic Dental Dystrophy" Karcher<sup>33</sup> describes a six year

molar which is not of the mulberry type on which there is no defect of enamel or early tendency to caries. The cusps, of normal size are rolled in and without any shoulder at the crown and give the appearance of being clinched. He believes that the same condition has been very recently described in Germany by Krevenberg and Schwisow.<sup>44</sup>

Kwazebart and Rosnowska<sup>45</sup> stress the great value of x-ray examination of the long bones in suspected congenital syphilitic infants as they were able to make the diagnosis in some cases before there was any other evidence whatever. Parmelee and Halpern<sup>46</sup> show the superiority of x-ray examination over clinical and serologic in the detection in infants by a study of 104 born at Cook County Hospital. They found that 95 per cent could be diagnosed through the evidence of bone lesions. Periostitis almost never accompanies osteochondritis in the newborn. It becomes moderately frequent by the sixth week and is present in more than half of the cases showing osteochondritis by the third month. Periostitis very rarely occurs as the only change.

Ingraham<sup>47</sup> found that darkfield examination of the umbilical vein was positive in nineteen of eighty-five living offspring of syphilitic mothers. This is very valuable just at the time when other clinical and laboratory aids are likely to fail. He points out that a negative darkfield does not rule out syphilis. Because the method is rather cumbersome, it is practical only when the mother is known to have syphilis.

Roberts<sup>48</sup> in collaboration with McCord has studied one thousand infants born of syphilitic mothers. Of 563 treated mothers 17.7 per cent produced syphilitic offspring. This is compared with 65 per cent syphilitic offspring from 317 untreated mothers. If the amount of treatment was carried up to nine or more injections of neoarsphenamine only 5.3 per cent produced syphilitic children.

Coppolino<sup>49</sup> reports 100 per cent morbidity of the offspring of untreated syphilitic primiparas as compared with 20 per cent for treated mothers. He is convinced that infants born of either treated or untreated mothers need no treatment provided there are no clinical or x-ray evidences at one month of age and the Wassermann is negative.

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Spangler<sup>54</sup> finds that a moderate degree of eosinophilia especially when associated with a lymphocytosis, occurring even periodically in an apparently nonallergic individual whose intestinal tract is free from ova and parasites, warrants the taking of blood tests and a persistent search for clinical evidence of syphilis. The literature is reviewed with a list of thirty references.

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as well as, if not more frequently than, any other test in use. It should not be suspected of nonspecificity by comparison with the Wassermann or any other test. Its specificity has been studied against known infections and known freedom from infection for many years."

Chargin, Leifer, and Hyman<sup>50</sup> have treated by continuous intravenous drip method twenty-five patients with early syphilis. They gave an average of 4 grams of neoarsphenamine per patient over a period of five days. No serious reactions were noticed. They warn that this is only a preliminary study and the method should not be adopted except under ideal conditions.

Heuck<sup>60</sup> and Vonkennel<sup>61</sup> report experimental and clinical use of gold in conjunction with arsphenamine and bismuth in the treatment of syphilis. They feel that this combination has promise.

Jordan and Osborne<sup>62</sup> find that patch tests of patients for sensitivity to the arsphenamines are unreliable. Robinson<sup>63</sup> found, from careful patch testing, that the detection of arsphenamine sensitivity by that method has no value, since it is sometimes positive in normal individuals and often negative in those known to be arsphenamine-sensitive.

Induced by a favorable report on oral bismuth which had followed careful study<sup>64</sup> of numerous bismuth compounds, Kolmer,<sup>65</sup> having determined that the toxicity of water-soluble potassium bismuth tartrate by mouth is very low for rabbits and rats, found it therapeutically valuable in the human being. He recommends it in the treatment of occasional cases of syphilis especially in those unable to pay for intramuscular injections or those who are traveling or who for social reasons must avoid the detection of injection marks. The dosage is three to six grains a day. He believes that oral bismuth is superior to mercury in any of its various forms being less toxic and more spirocheticidal.

Mulzer and Serefis<sup>66</sup> used a complex liver-bismuth salt called bismutrat in forty-nine cases including all stages of syphilis. They felt that their results were equal to and in some cases better than results in cases that received intramuscular bismuth. Wise and Sulzberger,<sup>67</sup> Editors of the *Year Book of Dermatology and Syphilology*, consider this method of treatment promising and state that one of them with others, is carrying on studies in the rabbit and the human being.

McCarthy and Dexter<sup>68</sup> carefully studied for bismuth deposits the mouths of about five hundred dentulous patients receiving intramuscular injections of bismuth salicylate. The incidence was about 80 per cent. Tartar accumulation was an important factor. In edentulous mouths the incidence was 9 per cent. There were only two cases of stomatitis in the series.

In private patients whose mouths are better cared for, the incidence was very low, about 5 per cent.

Kolmer<sup>69</sup> found daily inunction of rabbits with potassium bismuth tartrate to be without demonstrable curative value.

Oliver and Crawford<sup>70</sup> conclude from parallel series of cases treated with bismuth salicylate and iodo-bismuthate of quinine that the results suggest the superiority of the latter as regards both results and freedom from complications.

Sollmann, Cole et al.<sup>71</sup> report on the excretion of oral mercury which they believe began to be used therapeutically before 1535. They found that the excretion and presumably therefore the absorption and effective concentration in the tissues from the oral administration of 0.2 gram of mercury with chalk daily and 0.16 gram of protoiodide of mercury four times a day were nearly the same as obtained from 50 per cent mercurial ointment. Whereas from 0.15 gram of corrosive sublimate a day, the excretion was between one fourth and one third that with the administration of 0.65 gram of protoiodide a day. This difference corresponds closely to that in the content of mercury, but the excretion with this dosage of corrosive sublimate is probably below the desirable therapeutic level.

Sollmann, Cole et al.<sup>72</sup> give their conclusions regarding a series of studies on mercurial inunctions as determined largely by urinary excretion. Inunctions with metallic mercury secure a smoothly ascending concentration of the drug which declines rather slowly on discontinuance of medication. The amount excreted fairly parallels the concentration of the ointment. Cleansing the skin after inunction decreased the amount excreted by nearly one half. The oleate is colorless, therefore cleaner, easier to rub in as well or better absorbed, and definitely advantageous, if inunctions are to be used. Calomel ointment is ineffective.

Arsenoxide was studied by Paul Ehrlich before his discovery of "606" and was considered very potent but dangerously toxic. It has since been better purified and used in both experimental animals and the human being under the name of mapharsen. Gruhitz<sup>73</sup> from extensive tests of this drug in laboratory animals found that by mouth it had no protective value against syphilis, that its therapeutic value was equal intramuscularly and intravenously in single doses. The therapeutic index of mapharsen and neoarsphenamine was about equal but with repeated doses the former appeared superior to the latter. One milligram of mapharsen was shown to have higher therapeutic value than ten milligrams of neoarsphenamine.

Foerster, McIntosh et al.<sup>74</sup> report on their use in the human being of arsenoxide, now man-



ufactured under the name of mapharsen. They gave the drug intravenously to eighty patients with syphilis exclusive of neurosyphilis to a total of 2117 injections. Spirochetes disappeared usually within twenty-four hours from open lesions. Healing was as rapid as with arsphenamine. Wassermann reactions became negative in nearly all cases of early syphilis but returned positive in half the cases. Clinical relapse and serologic relapse were observed most often after irregular or short periods of therapy during the first half year with long lapses in treatment. Nitritoid reactions did not occur. The drug was usually well tolerated. Jaundice developed in four cases and accentuation of renal impairment was observed in four others. The authors feel that an extensive study of this drug for a period of years is justified. In the discussion Cole, from a study of one thousand injections, conservatively recommended the drug especially for its absence of nitritoid reactions and stated that he was pleased with its action. Wile agreed with Cole in his comments. Stokes made the point that reactions are a powerful factor in causing patients to discontinue treatment and that even if mapharsen should not prove so efficient it is worth further study for its lack of reactions if for no other reason.

Under the name of arsenoxide Raiziss and Severac<sup>7</sup> of the Dermatological Research Laboratories at Philadelphia compare this drug with neoarsphenamine. In rats and rabbits they found neoarsphenamine about five and one half times as effective in both its trypanocidal and spirocheticidal effect. In experimental rabbit syphilis the maximum tolerated dose and the minimum curative dose for arsenoxide are practically identical, which suggests that the clinical use of this drug in adequate curative doses might be fraught with considerable danger.

"Fixed" eruptions due to the trivalent arsenicals while very uncommon, have been occasionally reported. Kemp and Menninger report a case of "fixed" eruption due to tryparsamide of which they believe only one other case has been reported. It was not a contra-indication to further treatment.

Tryparsamide has been supposed to be singularly free from reactions. The only one which has received much attention is disturbance of the optic fields. Hoverson<sup>8</sup> calls attention to mental derangements which occur during the use of tryparsamide and usually quiet down when the drug is discontinued. The psychosis is abrupt in onset and is usually a delirium often with vivid hallucinations of either the auditory or visual type occasionally both and fear reactions with restlessness and overactivity.

Muncy<sup>9</sup> from a study of eye grounds in neurosyphilis concludes that (1) the presence

of contracted chromatic fields previous to the administration of tryparsamide is not a contra-indication to its use, (2) contraction of the color fields in patients with positive reaction of the blood is a presumptive sign of beginning neurosyphilis.

Simpson<sup>10</sup> feels that after using the Ketting hypertherm for inducing fever there is evidence that artificial fever therapy fortifies and intensifies the activity of antisyphilitic chemotherapeutic agents.

Moore and Solomon<sup>11</sup> give a good review of Ulrich von Hutten's writings early in the sixteenth century. He is credited with first having discovered "syphilitic paralysis." They quote numerous interesting passages.

Saito<sup>12</sup> states that the most common place for extragenital chancres in Japan is on the breasts making up 36.4 per cent in his series. Fingers come next with 12.7 per cent, lips 10.9 per cent, and eyelids 5.5 per cent.

Fales and Reinhard<sup>13</sup> report that syphilis is the most costly of communicable diseases. They state that although measles was epidemic in the city of Baltimore last year, a three-year comparison of the incidence of reported measles and reported syphilis shows that for 18,905 cases of measles, a high mark, there were 13,032 cases of syphilis. No other communicable disease could have such a high incidence without arousing the medical profession, the health departments, the city authorities, and the entire citizenry to action. Unlike measles which is normally a brief and passing disease syphilis accounts for 10 per cent of the deaths from heart disease, the leading cause of death, and for 12 per cent of persons in institutions for the insane. The city of St. Louis spends between two and two and one-half million dollars annually on the care and treatment of those having syphilis and gonorrhea says the report, and Baltimore undoubtedly spends a similar amount. A thoroughgoing public health campaign against these costly and destructive diseases is urged.

An editorial<sup>14</sup> in the *Veneral Disease Information* calls attention to the small amount of notice that seems so far to have been paid to good epidemiologic efforts toward eradicating syphilis. The work of Munson<sup>15</sup> in New York and Smith and Brumfield<sup>16</sup> in Virginia and the New York program which is being planned by Parran<sup>17</sup> show that beginnings have been made in this type of work in this country, but it has not been utilized to anything like the extent that it should be. It is true that it requires money, an organized effort and an especially trained personnel for the work, but it would be cheap at any price as the cost would be much less than that of caring for an increasing number of patients with syphilis. The policy of preventing this dis-



case instead of paying for its consequences would greatly reduce the tax burdens of the future. In an epidemic of smallpox or typhoid fever, effort is immediately directed to tracing the source. Such investigative work is equally important in syphilis and gonorrhea. Every health officer should realize the fact that these diseases are communicable and that there can be no control of a communicable disease without investigation of sources of infection.

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## DO YOU KNOW?

When Thomas Jefferson was president he actively supported the movement to establish smallpox vaccination.

In 1935 there were more than 8 000 cases of smallpox in the United States. This was half again as many cases as were reported in 1934. Yet vaccination has been practiced in this country since

1800 and is a certain way to protect the individual and to prevent the disease spreading to others. The northwestern states account for 5 000 of these cases. Washington, Idaho, Montana, Wyoming, Colorado, South Dakota, Nebraska and Kansas.

One out of every five white babies born will eventually die of some form of heart disease—*Public Relations Bureau, Medical Society of the State of New York, 2 East 107th Street, New York, N. Y.*

**CASE RECORDS**  
*of the*  
**MASSACHUSETTS GENERAL**  
**HOSPITAL**

ANTE MORTEM AND POST MORTEM RECORDS AS USED  
IN WEEKLY CLINICAL PATHOLOGIC EXERCISES

FOUNDED BY RICHARD C CABOT, M.D

TRACY B MALLORY, M.D., *Editor*

CASE 22321

PRESENTATION OF CASE

*First Admission* A twelve year old school girl was admitted complaining of stiff joints and diarrhea

About one year before admission the patient developed a loose watery diarrhea with eight to nine movements daily unaccompanied by fever or vomiting. Two weeks after the onset blood was noted in the stool for three days. There was occasional tenesmus, vague abdominal pain and the patient's weight dropped gradually from 78 pounds to 38 over a period of several months but rose again to 58 pounds at admission. After two and a half months she entered another hospital where a proctoscopic examination showed congestion of the mucous membranes and many scattered points of oozing. She received palliative and supportive treatment without subsidence of her diarrhea. While at the hospital she developed furunculosis and numerous muscular contractures. She was discharged after eight and a half months slightly improved and came to this hospital for further care.

Physical examination showed a poorly nourished child with marked pallor of the skin and mucous membranes. Numerous scars of previous abscesses were noted on the thighs, arms and face and there were draining abscesses on the left ankle and thigh. Both knees were fixed in flexion. There was some limitation of motion of the hips but the other joints were negative. The remainder of the examination was negative.

The temperature was 99.4°, the pulse 110. The respirations were 24.

Repeated urine examinations showed occasional sediment loaded with pus cells but were otherwise negative. The stools contained an abundance of mucus and occasionally large amounts of pus and blood. No parasites or ova were found. The blood showed a red cell count of 4,800,000 with a hemoglobin of 25 per cent. The white cell count was 12,800. Von Pirquet and intradermal tuberculin tests were negative.

A barium enema showed extremely rapid fill-

ing of the colon. There was no visible peristalsis or haustration. The colon was small, smooth and of even density throughout. X-ray examination of the joints showed some atrophy of the bones but no significant joint changes.

During her hospital stay the patient's temperature ranged between 98° and 100° irregularly and the diarrhea continued unchanged. Orthopedic treatment produced some improvement of the contractures. She received several transfusions and palliative care without subsidence of the diarrhea and on the fifty-first day an ileostomy was performed. At operation the entire colon was pallid, thickened, and contracted without normal haustrations. The cecum was not contracted but its walls were thickened and injected. The ileum appeared to be normal. Colonic irrigations through the ileostomy wound were performed thereafter. The patient showed slight improvement although the melena continued. After six months she was discharged to a convalescent home.

*Second Admission*, six months later, for further orthopedic care.

During the interval she had been fairly well. The ileostomy stoma functioned readily and only occasionally were pus and blood discharged from the rectum. She was unable to walk without assistance.

Physical examination was essentially unchanged. Limitation of extension of both thighs and knees persisted.

Traction was attempted but was discontinued promptly with the belief that the patient's general condition did not warrant further treatment. She was discharged on the fifth day.

*Third Admission*, one month later.

A week before reentry the patient developed swelling, dark discoloration, and pain in the left knee and ankle. The right knee and ankle were similarly affected but to a less degree. The swelling slowly subsided but the joints remained painful.

Physical examination showed an emaciated girl with dry scaly yellowish skin and considerable muscle atrophy. The tongue showed roughened edges, hypertrophied papillae and small whitish patches. The heart was slightly enlarged to the left and showed an occasional extrasystole. A widely transmitted systolic murmur was heard over the apical region. The lungs were negative. The right wrist, both ankles and the left knee were swollen, moderately tender and showed limitation of motion.

The temperature varied between 100° and 103° and the pulse remained above 120.

Examination of the urine was negative. The blood showed a red cell count of 4,100,000, with a hemoglobin of 60 per cent. The white cell count was 18,720. 74 per cent polymorphonu-

clears. A Wassermann test of the blood was negative. Colonic irrigation returned washings which contained both red and white blood cells microscopically. After seven days the patient was discharged slightly improved.

*Fourth Admission*, five years later.

Following discharge the patient had periods of partial remission but most of her previous symptoms returned intermittently. Three weeks before returning to the hospital she again developed multiple joint pains and three days prior to entry a painful swelling appeared at the outer aspect of the right knee. This rapidly increased in size, ruptured, and discharged thick purulent material. Other abscesses appeared on both legs subsequently.

Physical examination showed multiple ragged scars in different portions of the body and extremities. There was marked muscular atrophy of the extremities and many joints were ankylosed and tender. The ileostomy stoma was surrounded by an area of reddened induration and discharged considerable pus. There were several cutaneous abscesses on both legs.

The temperature was  $100^{\circ}$ , the pulse 120. The respirations were 20.

Examination of the blood showed a white cell count of 44,000. The abscesses were drained. Blood cultures and material from the abscesses produced no growth on culture. Culture of the rectal mucosa showed hemolytic streptococci.

X-ray examination of the bones of the feet showed marked bone atrophy with obliteration of the joint spaces.

The patient was treated surgically and by dietary measures and received colonic irrigations with various types of streptococcus antitoxic sera. She was discharged on the thirty-sixth day.

*Fifth Admission*, six and a half years later, at the age of twenty-four.

The patient remained comparatively well following her last discharge and no complaints were noted. Two days before returning to the hospital she suddenly developed generalized steady abdominal pain, there having been a bloody discharge from the ileostomy for several days. She took some sodium bicarbonate which was promptly vomited but the pain was slightly lessened. There was marked anorexia. On the day of entry the pain again became very severe and she vomited three or four times. She believed that the usual amount of material was passed through her ileostomy during this acute illness.

Physical examination showed a fairly well nourished young woman moaning with pain. The heart and lungs were negative. The abdomen was slightly distended and the ileostomy appeared to be functioning normally. There was moderate generalized abdominal spasm,

more marked on the right side, flank, and right costovertebral angle. In these regions there was marked tenderness and rebound tenderness. Rectal examination could not be done because of tightness of the sphincter.

The temperature was  $103^{\circ}$ , the pulse 120. The respirations were 25.

Examination of the urine was negative. The blood showed a red cell count of 4,000,000, 88 per cent hemoglobin. The white cell count was 33,700.

Shortly after entry a laparotomy was performed. Through a left paramedian incision the peritoneum seemed free of adhesions but the pelvis was filled with odorless turbid brownish fluid. The small intestine was negative but the segment between the ileostomy and cecum was not identified. The tip of the cecum was tremendously thickened, injected, tense and firm. What was believed to be an area of ascending colon was shiny and purplish in color and there was some adherent fibrin. The first portion of the transverse colon was thickened, pale and contracted. A right flank incision was then made and the cecum and ascending colon thus exposed were tense, firm and light pink in color with no evidence of necrosis. The entire segment of bowel was fixed. An area of cecum and ascending colon was packed off in order to produce extraperitonealization. On the following day a cecostomy was done and a few ounces of pus evacuated from the bowel. The temperature gradually subsided, the white blood cell count dropped to 6,000, and the abdomen became soft. The pericolic packs were gradually removed and the patient was discharged on the eighteenth hospital day.

*Final Admission*, two months later, thirteen years after the initial entry.

The patient, now twenty-four years of age, attended the Out-Patient Department several times. She felt well until two weeks before re-entry, when she developed a dull heavy feeling in the epigastrium which occasionally radiated beneath the sternum to the precordium. Sharp pains of a few minutes' duration were occasionally superimposed upon the dull discomfort but there was no vomiting, chills, fever, or abnormal bowel movements. Two days prior to admission a barium enema was attempted but no barium could be made to enter any of the four routes available. Thereafter she had severe sharp pain in the right lower quadrant and groin which radiated up the right side. The discomfort gradually lessened but continued with varying degree.

Physical examination showed no general change from that previously noted. There was marked tenderness and some reddening of the skin in the right lower quadrant. The scar of the more recent operation was slightly edematous.

ons and reddened. Extension of the right leg was painful.

The temperature was  $101^{\circ}$ , the pulse 110. The respirations were 25.

Examination of the blood showed a red cell count of 5,000,000 with a hemoglobin of 70 per cent. The white cell count was 24,500, 86 per cent polymorphonuclears.

Pain in the right lower quadrant continued and the patient's temperature fluctuated irregularly between  $95^{\circ}$  and  $102^{\circ}$ . The cecostomy wound was probed and dilated and about ten ounces of pus released. A catheter was inserted and suction drainage instituted. She improved slightly but on the fourteenth day an abscess of the lower end of the cecostomy wound ruptured spontaneously. Two weeks later material drained from the ileostomy was guaiac-positive. At this time she had a profuse hemorrhage from the cecostomy for which she received a transfusion and parenteral fluids. She improved considerably and the cecostomy catheter drained some pus but no blood. On the forty-sixth day a large, hard nontender mass was noted filling the entire right side of the abdomen and peculiar glistening grayish granulations appeared in the cecostomy wound. The patient became extremely weak, went rapidly downhill and died on the fifty-first hospital day.

#### DIFFERENTIAL DIAGNOSIS

DR. RICHARD H. SWEET: This is a very long history which represents to my mind a characteristic case of ulcerative colitis with all of the symptoms and some of the complications of that disease but it has an unusual termination which I am not able to explain adequately. Why do I call this a typical case of ulcerative colitis? First of all in reviewing the history we see it begins in a young girl of twelve and we notice at the last admission that she was twenty-four years old when she died. In other words this was a long continued disease with many exacerbations and remissions.

At the first admission we have the characteristic finding of onset of the disease with watery diarrhea with some fever, some vomiting and then finally the passage of blood, tenesmus, abdominal pain and all of the symptoms which go with it: an immense loss of weight, and the characteristic finding in the early stages of the disease, namely, through the proctoscope there were seen edema and congestion of the mucous membrane with definite oozing from many small hemorrhagic points in the mucous membrane itself.

On physical examination she was poorly nourished and had the pallor that goes with the disease. We also notice that she had some flexion deformities of the hips and of the knees probably due to being ill in bed for a considerable period.

Then the third characteristic to note is the stools. She passed stools which often contained a lot of mucus and sometimes large amounts of pus and blood. She had a marked secondary anemia. No ova were found, no evidence of parasites and I assume no dysentery organisms. Finally we come to the x-ray finding which is also characteristic, namely, the barium enema showed an outline of the colon with no peristaltic motion, no haustrations. A small contracted smooth colon was outlined by the x-ray.

The patient was treated in the hospital for a considerable period of time, was given transfusions and finally apparently was not doing satisfactorily so they decided to do an ileostomy. Here again we see another characteristic of the disease, namely, the surgeon's description of the colon as he saw it at operation. I think it is an excellent one. He says it was pallid, thickened and contracted without normal haustrations. To those who have observed the colon of ulcerative colitis at operation I think that description will be very familiar.

Finally after a long period of time she was discharged and after six months came back for another hospital stay when an attempt was made to correct the deformities of the extremities but they gave it up because they believed that she was too ill. Then she had a third admission one month later, at which time she came in with what was apparently a definite acute arthritis with discoloration and swelling about the left knee and left ankle. That is a fairly frequent complication of cases of ulcerative colitis. We notice also that there was some enlargement of the heart and a systolic murmur. Here again we note that she had a significant degree of anemia and that she was running a considerable elevation of temperature which was probably due to arthritis, as nothing is said about the state of her colon at that admission. Then she went home and we hear nothing from her for a period of five years but we notice that when the history was taken that she had not been entirely well during that period but had had remissions and exacerbations of the disease. She came in this time with multiple joint pains and a definite abscess about the knee joint which ruptured spontaneously and drained a purulent discharge. She had other peripheral abscesses. Of course in a very sick patient we not infrequently see peripheral abscesses such as these. It seems to indicate a low resistance to infection. They cultured her stools and rectal mucosa and found hemolytic streptococci. The cultures from the abscesses were negative. It is rather interesting that she was given colonic irrigations with various types of streptococcal antisera with apparently no benefit. Then she went home and stayed away from the hospital for another long period.

clears. A Wassermann test of the blood was negative. Colonic irrigation returned washings which contained both red and white blood cells microscopically. After seven days the patient was discharged slightly improved.

*Fourth Admission, five years later*

Following discharge the patient had periods of partial remission but most of her previous symptoms returned intermittently. Three weeks before returning to the hospital she again developed multiple joint pains and three days prior to entry a painful swelling appeared at the outer aspect of the right knee. This rapidly increased in size, ruptured, and discharged thick purulent material. Other abscesses appeared on both legs subsequently.

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Physical examination showed a fairly well nourished young woman moaning with pain. The heart and lungs were negative. The abdomen was slightly distended and the ileostomy appeared to be functioning normally. There was moderate generalized abdominal spasm,

more marked on the right side, flank and right costovertebral angle. In these regions there was marked tenderness and rebound tenderness. Rectal examination could not be done because of tightness of the splincter.

The temperature was 103°, the pulse 120. The respirations were 25.

Examination of the urine was negative. The blood showed a red cell count of 4,000,000, 88 per cent hemoglobin. The white cell count was 33,700.

Shortly after entry a laparotomy was performed. Through a left paramedian incision the peritoneum seemed free of adhesions but the pelvis was filled with odorless turbid brownish fluid. The small intestine was negative but the segment between the ileostomy and cecum was not identified. The tip of the cecum was tremendously thickened, injected, tense and firm. What was believed to be an area of ascending colon was shiny and purplish in color and there was some adherent fibrin. The first portion of the transverse colon was thickened, pale and contracted. A right flank incision was then made and the cecum and ascending colon thus exposed were tense, firm and light pink in color with no evidence of necrosis. The entire segment of bowel was fixed. An area of cecum and ascending colon was packed off in order to produce extraperitonealization. On the following day a cecostomy was done and a few ounces of pus evacuated from the bowel. The temperature gradually subsided, the white blood cell count dropped to 6,000, and the abdomen became soft. The pericolic packs were gradually removed and the patient was discharged on the eighteenth hospital day.

*Final Admission, two months later, thirteen years after the initial entry*

The patient, now twenty-four years of age, attended the Out Patient Department several times. She felt well until two weeks before re-entry, when she developed a dull heavy feeling in the epigastrium which occasionally radiated beneath the sternum to the precordium. Sharp pains of a few minutes' duration were occasionally superimposed upon the dull discomfort but there was no vomiting, chills, fever, or abnormal bowel movements. Two days prior to admission a barium enema was attempted but no barium could be made to enter any of the four routes available. Thereafter she had severe sharp pain in the right lower quadrant and groin which radiated up the right side. The discomfort gradually lessened but continued with varying degree.

Physical examination showed no general change from that previously noted. There was marked tenderness and some reddening of the skin in the right lower quadrant. The scar of the more recent operation was slightly edematous.

about as it is written down here, a large ten-  
markedly thickened cecum with very much in-  
jection and with an area you could see on the  
mesial aspect of the ascending colon near the  
hepatic flexure which was dusky but shiny.  
This was quite a surprise and we concluded  
that this patient had a constriction of the  
transverse colon at its beginning roughly in re-  
lation to the hepatic flexure and that the  
ileocecal valve if you will or at some point be-  
tween the ileum and the cecum was also  
occluded so that she had a blind segment of the  
colon occluded distally and occluded proximally  
with reactivation of the disease. This was  
a complication that we have discussed a great  
deal but have never seen. Therefore we went  
into the right flank hopeful that the cecum was  
stuck at that area and we could make a hole in  
it. It was entirely free, however, with about an  
inch between the abdominal wall and the rigid  
cecum and no possible way of getting hold of  
it without contaminating the entire cavity.  
Therefore what we did was to pack the  
sponges in the hole one downward to the bottom  
of the pelvis one upward toward the flank  
and the other straight in to the cecum with  
the idea of producing adhesions. Forty-eight  
hours later without anesthesia the sponge going  
directly to the cecum was removed and a trocar  
cecostomy done, catheter put in and the trocar  
slipped out. She was immediately relieved.  
We wanted her to go home and then come back  
and have the colon out. She was so well that  
she refused to come in. So we kept a little  
tube in the cecum. Then she began to have  
trouble, the tube had come out and stopped  
draining and she was readmitted. The second  
time she never improved. We put her on suc-  
tion as we did the first time but it did not help.  
In spite of everything that was done she went  
downhill and we could not tell why until this  
lesion cropped out. It at first looked very  
much like granulation tissue—so much so that  
the house officers who had seen her every day  
had been trying to burn it down with silver  
nitrate. It was firm however and nothing else  
could have looked and felt like that but some  
form of malignancy. This is the second case  
of malignant disease that we have had asso-  
ciated with ulcerative colitis in this hospital.  
The other one was an older patient and the as-  
sociation with ulcerative colitis was not quite  
so clear cut as this is. Bargen gives an inci-  
dence of two and a half per cent in 800 cases.

#### CLINICAL DIAGNOSES

Ulcerative colitis  
Carcinoma of the cecum

#### DR. RICHARD H. SWEET'S DIAGNOSES

Chronic ulcerative colitis  
Postoperative localized abdominal sepsis

#### ANATOMIC DIAGNOSES

Ulcerative colitis chronic  
Carcinomata multiple of the ascending  
colon  
Stenosis complete of the ascending colon  
the sigmoid and the rectum  
Diverticulum traction of the hepatic flexure  
Volvulus of the cecum and the terminal  
ileum  
Acute ileitis

#### PATHOLOGIC DISCUSSION

DR. MALLORY: We have a picture which I  
would like Dr. McKittrick to demonstrate to  
you.

DR. MCKITTRICK: This was not quite so sat-  
isfactory as it might have been because we  
were not able to get permission for a complete  
examination. This had to be drawn without  
removing anything from the abdomen. Miss  
McLachlan has done a splendid job, however, in  
representing the segment of colon as it appeared  
at postmortem examination. It shows the fun-  
gating tumor in the cecum and also the com-  
plete constriction of the transverse colon in the  
upper right hand corner of the picture.

There is one point that was not given in the  
history and probably is not to be found in the  
record. She had been followed for a long time  
in the Out-Patient and was brought into the  
hospital with the idea of closure of the ileosto-  
my. She had been perfectly well for about five  
years, was the picture of health and her dis-  
ease was not bothering her at all but some-  
one suggested that she might have the ileostomy  
closed. At that time it was impossible to do a  
rectal examination because of complete occlu-  
sion of the anal ring. In the Gastrointestinal  
Clinic we asked for a barium enema. She went  
to the x-ray department and they could not  
get a catheter in.

DR. MALLORY: There are several unusual  
features about the case. You can see in the  
picture the mass of tissue projecting from the  
cecostomy wound. The entire cecum and as-  
cending colon were involved in this papillary  
carcinomatous growth. The transverse colon  
was white and the mucosa completely atrophic  
the rather characteristic late stage of ulcerative  
colitis. Then sharply at the splenic flexure the  
colon suddenly disappeared as a hollow viscus  
but continued as a solid cord not much over  
1 centimeter at most 14 mm. in diameter. We  
made sections across the descending colon at  
numerous levels and there was no trace of a  
lumen in any one of them. Microscopic sections  
showed perfectly good muscular layers with the  
nerve plexus in between but the lumen was  
filled with fat tissue. There was fibrosis but  
otherwise no remnant of inflammation. It looks  
exactly like a completely obliterated appendix  
but it is quite astonishing that this could occur

of time, six and a half years and then came in with a story which sounds like one of the known complications of ulcerative colitis, namely, acute perforation. We see that two days before this fifth admission, at the age of twenty-four, she had the sudden onset of generalized abdominal pain which was steady in character and therefore suggests that she had a perforation with peritonitis. She had some vomiting but you will notice that whoever took the history must have been thinking of the possibility of obstruction because the note is made that the ileostomy was working well. The assumption therefore would be that there was no element of obstruction. On physical examination the abdomen was distended, with considerable spasm present throughout more on the right side, in the flank and right costovertebral angle, suggesting that the perforation was in the right half of the colon rather than somewhere else. She had marked temperature elevation. She was obviously quite sick. The white count was 33,700.

Now, of course, they very properly did a laparotomy through a left paramedian incision, and found the pelvis full of odorless turbid brownish fluid. In view of the fact that the peritoneum seemed to be free from adhesions, at least my impression from the reading of this description here is that the operator thought there was not a generalized peritonitis because you will notice that he describes the condition of the cecum and ascending colon and then proceeds to make another incision, as if he felt that he could accomplish nothing through the anterior abdominal incision. An incision was, therefore, made in the right flank, I presume with the idea that there was a retroperitoneal perforation from that portion of the bowel which had given a localized abscess in the flank. The region behind the cecum and ascending colon was then explored through that incision and apparently there was no evidence of any perforation or of any necrosis of the intestine at that point.

From that point on I have difficulty in following the course of events because you see the following day a cecostomy was done. I cannot quite see why a cecostomy was done, but a certain amount of pus was evacuated from the bowel and following that the patient seemed to recover and was discharged from the hospital. At the end of two months she came back to the hospital again and this time had definite sepsis in the right half of the right flank region, in the region of the old operative wounds suggesting a continuation of the sepsis which she had there before. On probing the cecostomy wound about ten ounces of pus was released and then after two more weeks she ruptured some more pus through the lower end of the incision and then finally she had a rather massive hemor-

rhage from the cecostomy opening which probably came from the large intestine, another one of the complications of ulcerative colitis. Finally after another long stay in the hospital she died after a gradual downhill course, during, I should assume, from the sepsis that she had resulting from the disease.

It seems to me that it is obvious what the primary disease is but I should be very much interested to find out from the surgeon if he happens to be here, what the nature of the lesion was in the right lower quadrant which was the apparent cause of her death.

DR TRACY B. MALLORY: I do not believe the final statement as it appears in the record carries enough force to impress the reader, yet that was the most interesting feature in the case. Perhaps Dr McKitterick can describe the appearance of that cecostomy wound a little more graphically.

DR LELAND S. MCKITTERICK: About two or three weeks after her last admission there was still a tube in the opening in the cecum, that is, through the cecostomy wound. Granulation from the first seemed excessive, and soon it blossomed out very rapidly into a fungating mass, five or six centimeters in diameter, with a little opening in the center where the tube went in. That appeared, as I say, probably two to four weeks after her last admission and grew very rapidly in spite of the efforts on the part of the house officers to keep the granulations down.

DR MALLORY: It is a common thing to see a good deal of edematous swelling and redundancy of the tissues about an enterostomy but this was a much more definite mushroom-like growth than you commonly see under such circumstances. The tissue from the overgrown margin was biopsied and it showed an extremely atypical papillary adenomatous hyperplasia, the cells of which were so undifferentiated that a diagnosis of carcinoma *in situ* was made. There was no evidence of invasion in the specimen which we were given but the cells were so typical that we felt fairly certain of malignancy.

You might tell us what else you know about the case, Dr McKitterick.

DR MCKITTERICK: I should have felt badly if Dr Sweet had accurately diagnosed this case from the beginning because we changed our minds several times. Our preoperative diagnosis was partly incorrect and partly correct but mostly incorrect. I thought she had a mesenteric thrombosis secondary to a small bowel obstruction. She had a white cell count of approximately 40,000 at that time. We operated upon her with that diagnosis. She had no peritonitis whatever, a shiny peritoneum throughout, the small bowel absolutely all right, her large bowel in the right side of the abdomen was



or Hinton test would be of interest although a negative test would not absolutely rule out syphilis. However in a child there should be other stigmata of congenital syphilis. The character of the masses described does not seem to be consistent with an inflammatory process.

It seems to me we must assume that the mass is a neoplasm and there is no evidence in the record to suggest that we are dealing with a metastatic tumor or a generalized process like myeloma or lymphoma. It should be remembered, however, that both myeloma and lymphoma may manifest themselves purely as a localized process, especially in the early stages of the disease.

Assuming a primary localized tumor, the nature of the process must be arrived at on very meager evidence. The brief history suggests fairly rapid growth and makes us suspect malignant disease. The firmness of the mass, presumably without discoloration and the absence of pulsation or bruit, make hemangioma (and aneurysm) very unlikely possibilities. The absence of x-ray evidence of bone disease practically rules out the possibility of Ewing sarcoma, osteogenic sarcoma or giant cell tumor of bone.

Thus we are left with a rather rapidly growing firm tumor of the soft parts in this area. We at once think of a fibrosarcoma or a neurofibrosarcoma. Chondroma originating in cartilaginous structures in relation to epiphyseal or articular structures cannot be ruled out. However this tumor is usually multiple and usually offers some x-ray evidence of its presence. Giant cell tumor of fascia or periarticular soft parts must be considered a possibility.

I think it is impossible to go farther in the differential diagnosis of this tumor without additional evidence. Such evidence the most desirable of all would consist in biopsy. With tumors in certain locations preparations are made for biopsy to be followed at once by radical attack on the tumor mass if frozen section diagnosis calls for it. Presumably this course was followed in the present case with a preoperative diagnosis of tumor, probably sarcoma.

#### CLINICAL DISCUSSION

DR EDWARD D. CHURCHILL. The x-ray examination showed a definite abnormality of the first rib although it appeared to be a congenital bifurcation of this rib rather than a tumor. On examination the tumor appeared to arise from the clavicle but no x-ray abnormality of the clavicle was demonstrable.

This case represents a classical picture in surgical pathology but one that the present generation sees so rarely that the correct diagnosis

was not made. A familiar examination question in surgery for years has been the differential diagnosis of tumors arising in the inner third of the clavicle, and gumma ranks high in the differential diagnosis. The incidence of untreated congenital lues is now so small, at least in our clinic that although this diagnosis was considered, the alternative diagnosis of tumor was deemed more likely. Through an error the Wassermann report was recorded as negative before operation so we proceeded along the lines that Dr. Taylor has indicated to do a biopsy of the tumor. The simplest form of biopsy seemed to be a complete extirpation, and this was carried out. A transverse incision was made and the mass was found closely fixed to the inner end of the clavicle in the region of the origin of the sternomastoid muscle. This muscle and others surrounding it were involved in an infiltrating and sclerosing proliferation of fibrous tissue. The periosteum was separated from the clavicle beneath the tumor and stripped from the bone revealing pitted atrophic bone. The mass was removed in its entirety. Healing was accomplished by first intention. The peculiarities of the "tumor" on dissection led us to do this conservative operation rather than embark upon a radical resection of the clavicle which in the light of the pathological report would have been inadvisable. When the pathologist reported a gumma we were, of course considerably chagrined that the diagnosis had not been made. A check-up on the serological reports showed a weakly positive Wassermann and a positive Hinton. On removing the boy's spectacles facies were exposed that were in themselves diagnostic of congenital lues. The incisor teeth were suggestive and the six-year molars were missing from early decay. Fortunately our surgical error was not a serious one but I feel distinctly that it was one that would not have been made by the surgical service twenty-five years ago.

#### PREOPERATIVE DIAGNOSIS

Tumor in the region of the left clavicle

DR GRANTLEY W. TAYLOR'S DIAGNOSIS

Tumor of the left clavicle probably sarcoma

#### PATHOLOGIC DIAGNOSIS

Gumma in the region of left clavicle

#### PATHOLOGIC DISCUSSION

DR TRACY B. MALLORY. This case has been presented to Dr. Taylor on the basis of the evidence which was at hand at the time of the patient's operation. As Dr. Taylor pointed out a definite diagnosis in such cases is more often than not impossible without the aid of biopsy and microscopic examination and on this

all the way from the splenic flexure to the anus. It is no wonder that the attempt at a barium enema was unsuccessful!

There were numerous other complications. She had what appeared to be a traction diverticulum in the region of the hepatic flexure, a very sizable affair, and the cecum had managed to rotate on itself with resulting gangrene of the whole lower end of the cecum and of the terminal ileum.

A PHYSICIAN: Did not the hemorrhage from the bowel have any significance in view of the findings?

DR MALLORY: I think it did. This loop of ileum which was gangrenous was also adherent to the gangrenous sigmoid, with deep ulceration at that point and the blood which came out of the proximal end of the ileostomy was coming from this gangrenous bit of ileum down here, not from the cecum.

A PHYSICIAN: So it did not necessarily indicate cancerous degeneration?

DR MALLORY: No.

DR McKITTRICK: I saw bloody material coming from the proximal end of the ileostomy, not in relation to the cecum at all and that was quite confusing.

DR MALLORY: I will show you a microscopic section of that cecum. It is hardly credible if you do not actually see it.

This is a total cross section of the descending colon. You can see the muscular layers around the outside, the lumen of the gut completely filled with fat and fibrous tissue, occasional spots of lymphocytic infiltration but essentially the inflammatory process has died out. This is a healed lesion so far as infection is concerned. The tumor from the sigmoid is obviously a papillary carcinoma, polypoid in type. That is the characteristic type that has been seen in similar cases here and elsewhere.

### CASE 22322

#### PRESENTATION OF CASE

An eleven year old white schoolboy was admitted complaining of a tumor of the shoulder.

About two months before entry the patient first complained of pain over the medial aspect of the left clavicle. The pain persisted for about two weeks and then disappeared, but before it had subsided entirely he noticed some swelling in the area involved. The swelling gradually increased until it produced a large oblong mass projecting 3 centimeters above the clavicle. The mass was fixed and caused no discomfort. There was no history of contributory trauma, nor were there any associated symptoms.

Physical examination showed a well developed and nourished boy in no discomfort. He stammered considerably when responding to

questions. Over the left clavicle at the junction of the middle and medial thirds there was a firm, nontender, smooth, rounded mass, measuring 4 by 4 centimeters, apparently fixed to the clavicle. No bruit was audible over it. No glands were palpable. The remainder of the physical examination was negative.

The temperature, pulse, and respirations were normal.

Examination of the urine was negative. No Bence-Jones bodies were found. The blood showed a red cell count of 5,050,000, with a hemoglobin of 95 per cent. The white cell count was 9,800, 48 per cent polymorphonuclears. The serum calcium was 10.61 milligrams and the phosphorus 4.4 milligrams. The phosphatase was 5.5 units.

X-ray examination of the cervical spine and chest with special reference to the tumor mass in the left side of the region of the sternoclavicular joint revealed evidence of multiple congenital anomalies. There was a hemivertebra present in the upper dorsal region on the left associated with considerable deformity of the ribs, the first two ribs on the right being fused. The clavicles are essentially normal. There was no evidence of disease in the bones of the arms, forearms, legs or femora. A tangential view of the sternoclavicular joint revealed a soft tissue mass overlying the left sternoclavicular joint which did not contain calcium or involve the bone.

On the fifteenth hospital day operation was performed.

#### DIFFERENTIAL DIAGNOSIS

DR GRANTLEY W. TAYLOR: In this case we are concerned with a tumor mass of fairly rapid development in an apparently healthy child. Although pain preceded the onset of the tumor, at the time of examination there were no subjective symptoms. Aside from the tumor itself we have nothing but negative evidence on which to base the diagnosis.

The absence of trauma antecedent to the development of the mass justifies us in ruling out a hematoma, a separation of the sternoclavicular joint, or callus formation from a recent clavicular fracture. The likelihood of these injuries is also excluded by the x-ray examination and by the absence of symptoms.

The possibility of some congenital anomaly to explain the mass is raised by the presence of bone anomalies elsewhere, but it is ruled out by the negative x-ray.

Tuberculosis and syphilis are the infections which could give rise to a mass in this region. Tuberculosis could be primary in the cervical spine, or lymph nodes or in the costal cartilage of the first rib. Gumma in the region of the clavicle is not uncommon and is often mistaken for neoplasm. Record of a Wassermann

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## THE TWO HUNDREDTH ANNIVERSARY OF THE NOTABLE CONTRIBUTION ON SCARLET FEVER BY WILLIAM DOUGLASS<sup>1</sup>

WHILE Sydenham in 1676 was the first to give us the name "scarlet fever" (*Febris Searlatina*) it is somewhat doubtful whether he described the disease to which this name has since been given. Indeed it is not impossible as Weaver<sup>2</sup> has suggested that Sydenham was describing German measles, because no mention was made of the throat or tongue, and, furthermore it was of such a mild character as to be a "disease in name only."<sup>3</sup>

It remained for William Douglass of Boston to be the first to describe scarlet fever in unmistakable terms. In 1736 he wrote a treatise on the epidemic of this disease which started in 1735 in Kingston New Hampshire and spread in a severe form over New England. Douglass was the first to describe the course of an epidemic of this disease and give a clinical description of the mild and severe forms. While we certainly

cannot go so far as Weaver, who affirms that the Douglass treatise was 'the first real contribution of America to the medical literature of the world' it was undoubtedly the second<sup>4</sup> and a true landmark in our knowledge of scarlet fever. It is really of greater importance than Sydenham's term "Scarlet fever" and serves as the forerunner of Withering's<sup>5</sup> classic in 1779.

Zabdiel Bowditch's<sup>6</sup> report on smallpox inoculation is certainly the first great American contribution to medical literature. Bowditch's practice of inoculation was instigated by Cotton Mather who had become interested in the possibilities of this procedure at least five years before and had more recently borrowed a treatise on the subject from Douglass. The Bowditch report exerted a profound influence in London. The publication of Douglass ten years later was of an entirely different order, consisting of brilliant original observations based on a scholarly foundation. Unfortunately Douglass is remembered for his vehement opposition to inoculation against smallpox and for his abusive attacks on Bowditch<sup>7</sup> and more particularly on Cotton Mather.<sup>8</sup> From the viewpoint of the history of smallpox Douglass is a sinister figure who in an offensive manner impeded the progress of inoculation but as seen through the rose-colored spectacles of a recognized authority on scarlet fever Weaver<sup>10</sup> he is made out to be a man with faults it is true but a physician of learning and ability, a botanist and historian as well as a public-spirited citizen. Weaver reminds us that Cotton Mather was early in his career an ardent persecutor of witches a point harped on unmercifully by Douglass. We must bear in mind that Douglass genuinely disapproved of Mather's instigation of the new method, and like the majority of doctors resented the entry of the church into the domain of medicine just as Sydenham was at first opposed to the use of the Jesuits' Bark from Peru in cases of malaria. In 1730 and again in 1751 Douglass wrote in favor of inoculation yet it was not until 1754 that the College of Physicians of London ventured to give it support. At this 200th anniversary of his famous treatise on scarlet fever we get some satisfaction in the realization that at the time of its publication Douglass had withdrawn his opposition to inoculation even though he would never give due credit to Mather and Bowditch.

As the only physician in Boston at that time who held a medical degree<sup>11</sup> Douglass was probably the leading consultant of the city. He openly denounced the 'kidnapping' of seamen on the ships in Boston Harbor for service in the Royal Navy and objected with clear reasoning to the dangers of inflation with paper Colonial currency.<sup>12</sup> The township of Douglass in Massa-

basis the child was operated on without waiting for more elaborate diagnostic measures

When the tumor was cut down upon it proved to be a mass of dense fibrous tissue in the center of which was an area of yellowish necrosis. A frozen section was strongly suggestive of a gumma and this diagnosis was eventually confirmed. It was felt that excision was nevertheless the most suitable form of treatment and the entire mass, 8 x 5 x 4 cm in size, was dissected out.

As Dr. Churchill has pointed out, an untreated congenital syphilitic has become a great rarity in this clinic and very few of our generation of physicians have seen a significant number of cases. An exception, however, is Dr. Cheever, who for years has been particularly interested in the problem of congenital syphilis and when he was called in consultation to see this patient he pointed out the, to him, obvious stigmata which Dr. Churchill has mentioned.

This is the type of case in which to my mind the Hinton test is most valuable. It is considerably more sensitive than the standard Wassermann reaction and, as is well known, will pick up a great many cases of treated syphilis which the Wassermann test misses. Such cases, however, are rarely particularly important unless the history has been falsified. In congenital syphilis, however, it is not infrequent to find a definitely positive Hinton test in the face of an entirely negative Wassermann reaction. I was particularly impressed a few years ago in checking over the results of the Hinton test to discover two children with positive Hinton tests, negative Wassermann reactions, and no stigmata whatever of congenital syphilis. Nevertheless both children belonged to large families in which older siblings had had definite stigmata, and positive Wassermann reactions, and in each family the first child had been still born.

## THIS WEEK'S ISSUE

CONTAINS articles by the following-named authors

WELLE, FRANCIS L. B.S. M.D. Harvard University Medical School 1925 Assistant Surgeon Massachusetts Eye and Ear Infirmary Assistant in Otolaryngology, Harvard University Medical School His subject is Studies in Asthma XIX The Nose and Throat in Five Hundred Cases of Asthma Page 235 Address 395 Commonwealth Avenue Boston Mass

JOHNSON ALLEN S. A.B., B.A., M.D. Harvard University Medical School 1927 F.A.C.P. Visiting Physician Tuberculosis Division Springfield Health Department Hospital Assistant Visiting Physician Springfield Hospital His subject is Factors Influencing the Development of Tuberculous Infection in Childhood Page 239 Address 121 Chestnut Street Springfield Mass

CHEEVER AUSTIN W. A.B. M.D. Harvard University Medical School 1914 Assistant, Department of Dermatology and Syphilology, Harvard University Medical School Assistant Physician to Syphilis Out-Patient Department Massachusetts General Hospital Visiting Dermatologist Beth Israel Hospital Assistant Dermatologist Children's Hospital Consulting Dermatologist Waltham Hospital, Brockton Hospital, Goddard Hospital Brockton, Framingham Hospital and Florence Crittenton Home His subject is Progress in the Treatment and Diagnosis of Syphilis 1935 Page 242 Address 41 Bay State Road Boston Mass

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1935	Gill Charles Edward Westfield	30
1936	Gillis Edwin James Westfield	12
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chusetts was named after him in 1746<sup>1</sup>. However, his name is indelibly associated with the disease he described and to which he gave too long a name<sup>18</sup>. He remarked that the brilliant forms of it "were called by some a scarlet fever". The quaint terms and expressions of the period sometimes leave the modern reader in some doubt as to what was meant but it is highly probable that the readers of medicine two hundred years from now will have much greater difficulty understanding the present-day immunologic jargon applied to the streptococcus. In 1825 the Douglass treatise was republished in full in *The New England Journal of Medicine and Surgery* as a masterpiece of which New England might well be proud.

\* \* \* \* \*

Sydenham's subtle remark that scarlet fever is a disease in name only might well be applied today to this malady, the problems of which rock the conclaves of the medical profession at home and abroad. No less than two hundred strains of hemolytic streptococci divided into four groups have been found capable of producing a scarlet fever toxin. Bacteriologists and clinicians are divided among themselves on the very question of the entity of the disease, its cause, nature, prevention, and treatment. That a single strain of streptococcus can produce in one individual scarlet fever, in another sore throat without a rash, and in still another puerperal fever, has long been suspected by some and denied by others. Whether the rash is or is not an allergic manifestation, whether the toxoid is a true toxoid and as efficacious as the toxin, and, finally, the relative merits of antitoxin and convalescent serum, are all matters under discussion. And last but not least we have the Dick Patent—a sort of Prohibition Amendment to the Hippocratic Oath—which we like to think would outrage the ethics of Sydenham, Withering, and even William Douglass.

#### REFERENCES

- 1 Douglass William. The Practical History of a New Epidemical Eruptive Miliary Fever with an Angina Ulcusculosa which prevailed in New England in the Years 1735 and 1736 (Boston 1736). Reprinted in New Eng J Med and Surg 14 (1875) 1.
- 2 Weaver George H. Scarlet fever. Abt's Pediat 6:298 299 19-5.
- 3 Sydenham Thomae. Opera Omnia. Edited by Greenhill G. A. London 1844 p. 244.
- 4 Bartlett Josiah. A Dissertation on the Progress of Medical Science in the Commonwealth of Massachusetts (Read before the Mass Med Soc June 6 1810). Boston 1810 p. 7.
- 5 Withering William. An Account of the Scarlet Fever and Sore Throat or Scarlatina Anglosa. London 1779.
- 6 Boylston Zabdiel. An Historical Account of the Small Pox Inoculated in New England Upon all Sorts of Persons Whites Blacks and of all Ages and Constitutions With Some Account of the Nature of the Infection in the NATURAL and INOCULATED Way and their different effects on HUMAN BODIES With some Short Directions to the Unexperienced in this Method of Practice Humbly dedicated to her Royal Highness the Princess of Wales by Zabdiel BOYLSTON, Physician. London 1726.
- 7 Kittredge George L. Some Lost Works of Cotton Mather. Cambridge 1912 (Mass Hist Soc 46) pp 4.3 4.7.
- 8 Fitz Reginald H. Zabdiel Boylston Inoculator and the epidemic of smallpox in Boston in 1721. Bull Johns Hopkins Hosp 22:317 1911.
- 9 Kittredge George L. Mather's Several Reasons. Cleveland 1921 p. 12.
- 10 Weaver George H. Life and Writings of William Douglass M.D. 1691 1752. Bull Soc M. History Chicago 1921 p. 205.
- 11 Douglass is said to have been a pupil of Pitcairn at one time Professor of Medicine at Leyden. From this irascible Scotchman Douglass may well have acquired his disrespect for the church. It is not known where Douglass took his degree but he was one of a group of highly educated Scotch physicians who came to America in the early part of the eighteenth century. Douglass was born in Gifford County of Haddington Scotland about 1651 and arrived in Boston in 1716. He died in 1752. (Weaver 1921 pp 220 231).
- 12 Weaver 1921 p. 244.
- 13 Apparently the autopsies which he mentions having performed in some of these cases were the first recorded in America. He described the findings also in a letter to Coiden who in turn transmitted them to Fothergill (Weaver 1921 p. 240).

#### APPRAISAL OF VITAMIN D MILKS

AN impartial review which should be of general value, has been made by Philip C. Jeans of Iowa City to determine the relative values of different varieties of vitamin D milk for infants (*J. A. M. A.* 106:2066 and 2150, June 13 and 20, 1936). This review consists of an interpretation of all the important recent literature on the subject. The commercial vitamin D milks include broadly, milk directly irradiated, milk to which has been added a cod liver oil concentrate (Zucker process) and milk from cows whose ration includes an irradiated vegetable source of vitamin D, such as "yeast milk".

There are apparently two, and possibly only two, varieties of vitamin D—that of animal origin and that of vegetable origin, and it is probable that the animal does not change the biologic form of the vitamin when it makes the vitamin D available in the milk. While all animal sources may have a vitamin D of the same value, as may all vegetable sources, vitamin D of animal source appears to be more potent than vitamin D of vegetable source, possibly in the ratio of 15:1 when vitamin D milks are compared.

The information available concerning the value of animal source vitamin appears to be greater than that concerning vegetable source vitamin. Thus it is known that animal source vitamin D milk containing 135 U. S. P. rat units to the quart will prevent rickets, but this amount of vitamin D approaches closely the minimum effective level. Less vitamin D may initiate the healing of rickets than is necessary consistently to prevent it.

Moreover, the amount of vitamin D that barely prevents rickets does not permit the best growth of infants, nor does it permit retention of calcium and phosphorus as great as those considered desirable. An adequate amount of animal source vitamin D is considered to be the amount present in one teaspoonful of average high grade cod liver oil, or in milk containing 100 units to the quart. The same information about vegetable source vitamin has not been determined, nor is the minimal adequate dosage for either type as yet known.

1935 Wilcox Paul Harlan East Gardner	38
1936 Williams Walter Wilkinson Springfield	12
1936 Wolansae Stephen Worcester	12
1935 Younge Paul Adolph Milton	11
1935 Zovickian, Hovhannes Watertown	11

\*Prior to this the candidate's diploma was accepted by the Executive Committee on Medical Education and Medical Degrees. He was given a personal interview by this committee and permitted to take an examination before a Board of Examiners.

Readmitted to Centers

Total = 248

#### KEY TO MEDICAL COLLEGES

1. Yale University School of Medicine
2. Syracuse University College of Medicine
3. Vanderbilt University School of Medicine
4. University of Pennsylvania School of Medicine
5. University of Rochester School of Medicine
6. Middlesex College of Medicine and Surgery
7. University of Vermont College of Medicine
8. Hahnemann Medical College and Hospital of Philadelphia
9. McGill University Faculty of Medicine
10. Boston University School of Medicine
11. Harvard University Medical School
12. Tufts College Medical School
13. Albany Medical College
14. University of Vienna Medical School
15. Rush Medical College of the University of Chicago
16. University of Louisville School of Medicine
17. State University of Iowa College of Medicine
18. Johns Hopkins University School of Medicine
19. Georgetown University School of Medicine
20. College of Physicians and Surgeons Boston
21. Jefferson Medical College of Philadelphia
22. Medical College of Virginia
23. Washington University School of Medicine
24. University of California Medical School
25. Northwestern University Medical School
26. Laval University Faculty of Medicine
27. Tulane University of Louisiana School of Medicine
28. College of Medical Evangelists
29. Columbia University College of Physicians and Surgeons
30. University of Maryland School of Medicine and the College of Physicians and Surgeons
31. New York Homeopathic Medical College and Flower Hospital
32. University of Minnesota Medical School
33. Cornell University Medical College
34. University of Pittsburgh School of Medicine
35. Stanford University School of Medicine
36. National University of Athens School of Medicine Greece
37. University of Berlin
38. University of Michigan Medical School
39. Long Island College Hospital
40. University of Chicago School of Medicine
41. University of Toronto Faculty of Medicine
42. Drake University College of Medicine
43. St. Louis University School of Medicine
44. Missonri College of Medicine and Science
45. St. Louis College of Physicians and Surgeons
46. Temple University School of Medicine
47. Paval Universitil di Roma Italy
48. Royal Frederic University Tromsberg Norway
49. University of Kansas School of Medicine
50. University of Pecs Hungary
51. Medico-Chirurgical School of Lisbon
52. Woman's Medical College of Pennsylvania
53. Baylor University College of Medicine
54. Faculdade de Medicina e Cirurgia da Universidade de Coimbra, Portugal

## MISCELLANY

### THE CAPE COD HOSPITAL APPEALS FOR FUNDS

The Cape Cod Hospital located in Hyannis which is the only general hospital serving Barnstable County is appealing for funds to meet a deficit.

This hospital was established in 1919 and has grown so that now there are eighty beds including fifteen bassinets. The service is supplied to a thirty-thousand year round population augmented by about one hundred thousand summer residents. The American College of Surgeons has given this hospital a Class A rating.

This is an active hospital with an average of 5211 patients per day.

The equipment is up-to-date and the management excellent.

The President, Charles L. Arling has sent out 1000 letters setting forth the needs of the hospital.

### HEALTH OFFICERS MONTHLY STATEMENT OF VENEREAL DISEASES REPORTED IN THE NEW ENGLAND STATES

MAY 1936

This statement is issued monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The following reports were received from State Health Officers. The figures are preliminary and subject to correction. It is hoped that this will stimulate more complete reporting of these diseases.

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Connecticut	240	1.45	96	.58
Maine	53	.66	42	.52
Massachusetts	446	1.03	441	1.02
New Hampshire	15	.32	16	.34
Rhode Island	112	1.59	46	.65
Vermont	21	.58	21	.58

Treasury Department—U. S. Public Health Service

#### EDITORIAL NOTE

Figures for the whole United States show that there were reported in May 1936 22,959 cases of syphilis and 12,442 cases of gonorrhea.

These show the great public health problem in dealing with venereal diseases.

### ILLUSTRIOUS CONTRIBUTORS TO PUBLIC HEALTH

At the time of the dedication exercises of the New York City building to house the Department of Health Hospitals and Sanitation and the office of



1935 *Gittleman, Irving, Dorchester	44	1936 *Murphy, Lawrence, Newburyport	45
1935 Glick, Harry Sumner Dorchester	12	1936 Murray Thomas Oscar Worcester	12
1936 Goodnow, Chester Lloyd Franklin	12	1935 Nason, Louis Howard Boston	11
1936 Green, William Richard Lowell	12	1935 Naterman Hyman Louis, Roxbury	12
1936 Greene, Jeremiah Evarts, Newton Centre	11	1936 Nathanson, Seymour Isaac, Fitchburg	7
1935 Gurr, Joseph Francis Lawrence	19	1935 Newell, Howard Winthrop, Westfield	9
1935 Graybiel, Ashton, Cambridge	11	1936 Nicgorski, Eugene John, Gardner	10
1935 Haigis, Peter, Foxborough	10	1936 Nichols, Howard Gage, Haverhill	11
1936 Hajjar Solomon Gantous, Lowell	43	1936 Norton, Paul Lawrence, Cambridge	11
1935 Haling, Raymond Francis, Southbridge	10	1935 O'Neill Hugh Wilson, Jamaica Plain	4
1936 Hall Leonard John Lowell	12	1935 *Orlansky, George J, Dorchester	20
1936 Ham, Thomas Hale Boston	33	1936 *Oskar, Paul Augustine, Lawrence	6
1936 Hammer, Joseph, Wellesley	10	1936 Palmer, Edwin James, East Gardner	22
1935 Harrington Harold Francis, Seekonk	12	1935 Pappas, James Peter, Cambridge	12
1936 Harwood, Reed, Brookline	11	1935 Parker, Frederic Jr, Newton Centre	11
1935 Hathaway, John Seabury, Cambridge	11	1936 Pearson, Grosvenor Benjamin Roxbury	34
1936 Hayes, Paul Thomas Worcester	12	1936 Peatick George E, Westborough	8
1936 Healy, John Francis Lowell	12	1935 *Peters, Francis Donald Somerville	6
1935 Heller, Hyman, Webster	15	1936 Pfeifer, Ladislav Eugene, Springfield	12
1935 Hennessey James Alfred, Brookline	12	1935 *Pipkin, Hubert Alexander, Pittsfield	6
1935 Higgins, Donald Ellwood, Cotuit	11	1936 Poirier, Theophane Marcel, Marlborough	19
1936 Hill William Robinson, Taunton	11	1936 *Pratt Ernest F, Lowell	6
1935 Hindman, James Harold, Lawrence	12	1935 Prien Edwin Louis, Boston	11
1935 *Hoefer, Paul Frederick Adam Boston	37	1936 Rabnowitz Henry, Springfield	38
1935 Holt, William Leland, Jr, Brookline	11	1936 Ramsdell, Edward Snyder, Worcester	12
1935 Hook, William Gilbert, Danvers	10	1936 Reinherz George Chelsea	12
1936 Hooker, Sanford Burton, West Roxbury	10	1935 Ring, Lina Barbara Taylor, Arlington	10
1935 Hosman, Israel Daniel, Chicopee	40	1936 Riseman, Benjamin Dorchester	12
1936 Hosmer, Miriam Jewell, Wilmington	38	1935 Robbins Eleanor, Holliston	52
1935 Howard, Edgerton McClellan, Boston	29	1936 Roberts, Charles Dewees, Milton	11
1935 Hoyt, William Fenn, Longmeadow	11	1936 Roberts, Helen Lucile, Cambridge	38
1936 Ives, Lionel Mortimer Westwood	41	1935 Robinson, Hortensia Amanda Farrall, Newton Centre	18
1935 Johnson, Raymond Edwin, Newton High lands	11	1936 Robinson Leon Jerome Palmer	10
1936 Kahn Lester Sydney Brookline	12	1936 Roche William David Worcester	12
1935 Kelleher, John Joseph Jr Lawrence	12	1935 Rothschild David, Foxborough	9
1935 Kelley, John Samuel Jamaica Plain	10	1935 Rovner, Miah Henry, Norfolk	12
1936 Kelley, William Joseph, Roxbury	12	1936 Russman, Reuben Belmont	12
1935 Kenler Maurice David, New Bedford	12	1935 Russo Anthony, Reginald, Somerville	10
1936 King Samuel Joshua, Boston	11	1935 *Salemi, Charles Boston	6
1936 Koretsky, Leo Chelsea	21	1935 Scelso Salvatore Medford	10
1936 Kranes Alfred Boston	11	1935 Schneider Benjamin, Monson	12
1935 *Krobalski Joseph Lynn	20	1935 *Schraffa Louis Emilio East Boston	6
1936 Krumbhaar, George Douglas, Brookline	11	1935 Sewall Weston Roslindale	11
1936 Lavner Gerald, Haverhill	2	1936 Shannon Edward Terrence Fall River	19
1935 Ledger, George H, Taunton	46	1936 Sharp Morris Louis Foxborough	12
1936 Leone Joseph Peter Quincy	5	1935 Shea Philip Joseph North Cambridge	19
1936 Levine Louis Cambridge	12	1936 *Siegel Max Mattapan	45
1936 Lipton Joseph Harold, Quincy	12	1935 Simmons Fred Albert Jr Boston	11
1935 *Lobo, Jose Paulo, Fall River	51	1936 Simon Benjamin Worcester	23
1935 Loizeaux Marion Cotton Wellesley	33	1936 Sloane Albert Edward Chelsea	12
1936 Low Merritt Burnham, Roxbury	11	1936 Smedal Magnus Ingvald, Brookline	11
1935 Lynch George William, Woburn	11	1935 Smith Herbert Harold Brookline	10
1935 MacKinnon George Lincoln, Wollaston	12	1936 Spritz Benjamin Chelsea	12
1935 Maguire James Alfred, Atlantic	12	1935 Staples Clarke Chestnut Hill	11
1936 Mahoney, Alfred Vincent, Quincy	12	1936 Stella Frank Wakefield	12
1935 Mahoney Patrick James Brookline	11	1935 Strieder John William Arlington	11
1935 Mallory, George Kenneth Brookline	11	1935 Talkington Perry Clement, Taunton	53
1935 Maloney, John David Waverley	12	1936 Tarnower Samuel M Pittsfield	31
1935 Manwell, Claire Cutten Northampton	5	1936 *Tavares John Mathias Somerville	54
1935 Manwell Edward Jones, Northampton	5	1935 Tavor Zella Elleen Winchester	10
1936 Marshall Samuel Frederick, Newton	18	1935 Thompson Milton Strong Jr Boston	11
1936 Mayo, Leroy Edward Worcester	12	1936 Thompson William Graham Andover	11
1935 McAdoo Hosea Webster Arlington	27	1936 Thompson William Graham Andover	12
1936 McGinn Silvester, Brookline	11	1936 Tompkins Mary Isabel Boston	10
1936 *McHugh, William Patten, Peabody	6	1936 Trapp Carl Edward Dorchester	18
1935 McLean Sterling Alexander Middleborough	9	1936 Trevett Laurence Davies Stockbridge	12
1936 Mendenhall, Walter Leslie Cambridge	42	1936 Tribeman Melvin Samuel Haverhill	15
1936 Merrick, Francis Humphrey, Dorchester	10	1935 Turner Ralph Gordon Boston	30
1935 Merritt Hiram Houston Cambridge	18	1935 Tynan James Joseph East Milton	6
1936 *Messer Samuel Irving Waltham	44	1935 *Ullian Hyman Bertram Everett	9
1936 Montag Paul Peter Worcester	12	1936 Valliere Leon J Lowell	9
1935 Moore Carlton William Georgetown	10	1936 Vernon Hollis Edward Spencer	47
1935 Moore Merrill Boston	3	1936 *Vidoli Marius Francis Newton Highlands	12
1936 Mower Etamar Anses Cambridge	26	1935 Ward Arthur Henry, Winchendon	11
1935 Moxness, Bennie Arthur, Northampton	19	1936 Ward John Langdon Medford	25
		1936 Warren Harry Allen Boston	11
		1935 Welch Robert Francis Brockton	11

demonstrations in the control of malaria in Colombia Nicaragua Salvador and Albania for investigations and control of hookworm disease in Egypt and for surveys to determine the present status of hookworm disease in areas of North Carolina where campaigns for its control were carried on from 1910 to 1915 by the Rockefeller Sanitary Commission and the International Health Commission for studies of tuberculosis at Cornell University Medical College and in Alabama, Austria, Jamaica and Tennessee for the study of yaws in Jamaica and of undulant fever in France for research at Columbia University on the common cold for diphtheria investigations in Austria and Peiping China for studies on influenza to be carried out for the most part in the United States for research on typhoid fever at the State Institute and School of Hygiene Warsaw Poland for studies of mental hygiene in Tennessee and in Baltimore Maryland for the development under the Polish National Department of Health of a division of mental hygiene in the Warsaw School of Hygiene and for research on smallpox vaccine at the National Institute of Hygiene in Madrid Spain

In addition local and central government health services were aided in many states and countries and public health education was furthered by grants to institutions and by the maintenance of a fellowship program providing advanced training in public health and public health nursing for 188 persons

#### MEDICAL SCIENCES

During 1935 The Rockefeller Foundation appropriated \$2 733 050 for work in the field of medical science. Of this sum \$1 459 450 was contributed to projects for the advancement of psychiatry

For the development of teaching and research in psychiatry grants were made to the Institute for Psychoanalysis Chicago The Johns Hopkins University School of Medicine for teaching in child psychiatry the Institute of the Pennsylvania Hospital for training in psychiatry the Harvard Medical School and the Massachusetts General Hospital for a joint program in psychiatric training the University of Michigan Medical School to extend the scope of psychiatric training the School of Medicine of the University of Colorado for the teaching of psychiatry in medical surgical and obstetrical clinics and to the University of Chicago School of Medicine to establish and maintain a subdepartment of psychiatry

A contribution toward a laboratory building was given to the National Hospital Queen Square London

Fourteen research undertakings in clinical psychiatry and related fields received grants ranging in duration from one year to five years and in amount from \$5 000 to \$90 000. The institutions and fields of work thus aided were Maudsley Hospital London research in psychiatry University of London Galton Laboratory studies in human genetics in relation to mental disease Columbia University Col

lege of Physicians and Surgeons psychiatric research University of Amsterdam and the Worcester State Hospital Massachusetts, research on dementia praecox Cornell University Medical College studies on reflex behavior University of Chicago study of the physiology of sleep Northwestern University Medical School research in neuroanatomy New York University College of Medicine, research in experimental neurology, Dartmouth College Medical School research in physiological optics University of Pennsylvania School of Medicine research on growth of living tissues Harvard Infantile Paralysis Commission, field studies in North Carolina Chicago Area Project, field study of abnormal behavior and the Institute of the Educational Sciences Geneva Switzerland, research in child psychology

In connection with the application of modern psychiatric knowledge grants were made to the National Committee for Mental Hygiene in New York City the North Carolina Commission for the Study of the Care of the Insane and Mental Defectives and the Massachusetts Department of Mental Diseases

During the year the Foundation administered seventy-two fellowships in the medical sciences

Other important appropriations are the following Natural Sciences \$2 426 125, Social Sciences, \$3 807 500 Humanities \$1 169 440 and large grants to the Chinese Mass Education Movement

#### CHINA PROGRAM

The Chinese Mass Education Movement the Colleges of Public Affairs and Natural Sciences at Yenching University, and the Institute of Economics of Nankai University received aid from the Foundation during 1935. In the part of the China Program centering around Nanking in South China support was extended to the National Health Administration to the Commission on Medical Education and to three institutions interested in agricultural development the University of Nanking for its departments of agricultural economics and science the National Central University for work in animal husbandry and veterinary preventive medicine and the National Agricultural Research Bureau for insect control work. Local fellowships in China granted by the Foundation numbered 140

## CORRESPONDENCE

### PREJUDICE AGAINST VACCINATION TO CONTROL SMALLPOX

Editor, *New England Journal of Medicine*,

In the issue of June 25 page 1322 there are some inaccuracies the most glaring being that Dr Borlston was the target of a bomb. The bomb was thrown into the house of Cotton Mather who was the instigator of the inoculation for smallpox

I wrote an article covering inoculation but it was

the Chief Medical Examiner, November 26, 1936, Dr Charles Frederick Bolduan prepared a sketch of the building with the names of twenty nine Contributors to Public Health carved on the frieze

This sketch was distributed to the guests present on that occasion and in response to requests was put in permanent form in a brochure of thirty three pages made possible through the generosity of Mr Lucius N Littauer

The selection of names appearing on the frieze was made by a small committee appointed by the Public Health Committee of the New York Academy of Medicine Dr Samuel W Lambert was chairman of this small committee It was an arduous task to consider the great number of those whose names are identified with public health especially since the space permitted only the limited number designated above

In the brochure, in addition to the portraits of the selected persons, Dr Bolduan makes a brief reference to the distinctive contribution of each. The distribution of the names on the frieze is shown herewith

Worth Street (South Façade)	Lafayette Street (West Façade)
Moses	Koch
Jenner	Behring
Ramazzini	Pasteur
Hippocrates	Leeuwenhoek
Paracelsus	Ehrlich
Pinel	Billings
Lind	Harvey
Centre Street (East Façade)	Leonard Street (North Façade)
Farr	Bard
Howard	Semmelweis
Lister	Weich
Nightingale	Stephen Smith
Shattuck	E B Dalton
Morton	Biggs
Marion Sims	

Court Facing Leonard Street  
Walter Reed  
Gorgas

In closing the brief biographical sketches of these selected persons, Dr Bolduan pays especial tribute to Dr Hermann M Biggs in these words 'We have left for the last the name of Hermann M Biggs He, as the moving spirit of the New York City Department of Health from the late 30s until well into our present century was quick to seize upon all the contributions of bacteriology and the other medical sciences and apply them to improving the health of our city His vision brought about the establishment in this city of the first municipal bacteriological diagnostic laboratory in the world also the first antitoxin laboratory outside of Europe It was his understanding of the medical and social problems, and his organizing ability which made New York City the pioneer in tuberculosis control measures

It was he who first attacked the venereal diseases as a public health problem, and established the first public laboratory for making Wassermann blood tests free of charge Biggs was the outstanding pioneer in bringing to the public the fruits of the great discoveries mentioned above — and bracing them promptly and effectively He was not a discoverer, but a typical man of action, an accelerator and catalyzer Without him public health would have lagged far behind the brilliant strides made by research workers With him we have kept pace as we should'

The building and the activities of this great center of progress in public health work will justify a pilgrimage to New York even from the far-awest cities of the country

#### RESULTS OF TUBERCULIN TESTING BY COUNTIES FOR THE SCHOOL YEAR 1934-1935

GRADES 7, 9 AND 11—PUBLIC AND PAROCHIAL SCHOOLS

County	No Tested	Per Cent Reactors
Barnstable	667	17
Berkshire	2,456	17
Bristol	333	37
Dukes	82	28
Essex	8,802	24
Franklin	2,294	12
Hampden	8,671	19
Hampshire	363	31
Middlesex	13,585	23
Nantucket	62	8
Norfolk	2,977	27
Plymouth	93	21
Suffolk (See note)	10,124	16
Worcester	8,248	23

NOTE Boston not included—no testing done in schools Figures for Winthrop and Chelsea are for school year 1933-1934—no testing done school year 1934-1935—Submitted by the Massachusetts Tuberculosis League

#### THE APPROPRIATIONS OF THE ROCKEFELLER FOUNDATION

According to an annual report just published, The Rockefeller Foundation in 1935 expended \$12,725,439

Of especial interest to medicine are the following allocations

##### PUBLIC HEALTH

The International Health Division of The Rockefeller Foundation in 1935 operated on a budget of \$2,200,000 Grants were made for yellow fever studies in Brazil for research on yellow fever malaria and other diseases at the laboratories of the International Health Division at the Rockefeller Institute for field research on malaria in Cuba, Puerto Rico Albania Bulgaria Greece Italy, Portugal Spain and India and for laboratory studies of this disease at the University of Chicago for

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VOLUME 215

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NUMBER 7

## THE MASSACHUSETTS CANCER PROGRAM\*

BY HENRY D. CHADWICK, M.D.,† AND HERBERT L. LOMBARD, M.D.†

IN 1926 the Massachusetts cancer program was inaugurated. It was the result of work on the part of such a complete cross-section of the population of the State that it might well be studied with interest from the standpoint of an expression of State-wide and concerted opinion even if it had no deeper significance. A physician realizing the need for radium which few could afford, the industrious father of a large family realizing that a prolonged cancer illness in his family had a deep psychological effect upon every member of his household, a Catholic priest, a student of human nature and well versed in medicine itself, recognizing the imminent need of greater facilities because of the aging population and of the effect of hopelessness general among patients with this disease and their families, a women's organization which circularized its members with literature and studied the problem and then expressed itself concertedly for the program, veterans' clubs, national groups—all came forward and pleaded for the cancer program. There were some among the profession who questioned its place in the State Department of Public Health but after it became law they gave their cooperation.

The program is now in its tenth year and the death records of Massachusetts for 1935 show the first decrease in cancer deaths of both sexes in the twentieth century. On seven previous occasions the cancer deaths among males have shown a decrease and on four previous occasions among females but 1935 is the first year in which cancer deaths have decreased in both sexes simultaneously. Whether this is significant remains to be seen. Whether or not 1935 marks the beginning of a new trend in the disease the finding of Bigelow and Lombard† reported in 1934 that the adjusted rates of cancer among women had been stationary from 1920 to 1932 has been upheld for three additional years and the radical change in the Massachusetts cancer program beginning Octo-

ber 1934, offers hope of greater improvement in the future.

The Massachusetts cancer program as originally devised, and as still functioning with mod-

TABLE 1  
MASSACHUSETTS AGE, SEX ADJUSTED CANCER DEATH RATES

Adjusted to Massachusetts 1900 Population			
Year	Rate per 100 000 Male	Female	Population Total
1920	84.5	128.6	107.1
1921	85.9	129.4	108.2
1922	83.5	126.9	105.8
1923	85.4	125.8	106.1
1924	92.2	127.5	110.3
1925	89.6	130.0	110.4
1926	94.3	127.5	111.4
1927	92.5	128.9	111.1
1928	94.3	128.8	112.0
1929	93.3	127.4	110.8
1930	96.8	125.4	111.5
1931	93.5	126.2	110.3
1932	96.7	129.2	113.4
1933	101.5	128.7	115.5
1934	107.2	129.4	118.6
1935	99.2	125.2	112.5

ications, contains five major activities: hospitalization, tumor diagnostic service, research, diagnostic clinics, and education.

The Pondville Hospital opened in 1927 with a capacity of ninety beds. This institution admits patients with cancer and with suspicion of cancer, who cannot otherwise receive adequate care. In 1930 the bed capacity was increased to 115 and late in the fall of 1935 additional beds were made available, bringing the total to 145. With excellent facilities and with an exceptionally competent staff this institution was caring, in 1935, for approximately 8 per cent of the cancer load. In 1935 the Legislature authorized an additional cancer hospital in Westfield. This building will be opened in 1937. In spite of the increased facilities for hospitalization at Pondville and the additional facilities that have been made available by the new Palmer Memorial Hospital in Boston, opened in 1927, the Rose Hawthorne Lathrop Home in Fall River opened in 1932, the waiting list at Pondville indicates that at the pres-

From the Massachusetts Department of Public Health.  
Bigelow G. H. and Lombard H. L. Change in the Massachusetts cancer trend. New Eng. J. Med. 210:526 (March 8) 1934.

†Chadwick, Henry D.—Massachusetts Commissioner of Public Health. Lombard, Herbert L.—Director, Division of Adult Hygiene, Massachusetts Department of Public Health. For records and addresses of authors see This Week's Issue, page 302.

too long for *The New England Journal of Medicine*

Yours truly,

STEPHEN H. BLODGETT, M.D.

South Lincoln,  
Massachusetts

Dr. Blodgett is entirely right, the bomb was thrown into the house of Cotton Mather. The rabble, with halters in their hands merely threatened to hang Dr. Boylston, if they could find him, to the nearest tree.

DWIGHT O'HARA, M.D.

5 Bay State Road,  
Boston, Mass.

## RECENT DEATH

MCCARTHY—EUGENE JUSTIN MCCARTHY, M.D. of 124 Cedar Street, Malden, Massachusetts, died at the Soldiers' Home, Chelsea, July 28, 1936.

Dr. McCarthy was born in Malden and graduated from the Tufts College Medical School in 1905 and was a Fellow of the Massachusetts Medical Society and the American Medical Association. He served for fourteen years on the staff of the Veterans Bureau in Boston and for sixteen years on the Malden Park Commission.

## NOTICES

### FIRST INTERNATIONAL CONGRESS OF SANATORIA AND PRIVATE NURSING HOMES

The First International Congress of Sanatoria and Private Nursing Homes will be held in Budapest from September 16 to September 21 in the rooms of the Academy of Sciences. The Secretary of the Congress reports that many prominent persons have indicated their willingness to give lectures. It is requested that any who wish to submit titles of lectures, and have not already done so, send them as promptly as possible to the Organization Committee of the Congress, Budapest Sz. Margitsziget Szanatorium Prof. dr. Benczur.

### AN OMISSION

In the report of the exercises of the Annual Meeting of the Massachusetts Medical Society the name of Dr. Peer P. Johnson as a guest of the President at the head banquet table did not appear.

Dr. Johnson was present.

### REMOVAL

LOUIS ARKIN, M.D. announces the removal of his offices from 471 Commonwealth Avenue to 395 Commonwealth Avenue, Boston. Telephone Kenmore 8100.

### REMOVAL OF OFFICES

The Boston Council of Social Agencies (including Bureau of Research and Studies, Volunteer Service Bureau and Purchasing Bureau), the Boston Health

League and the Hospital Council of Boston moved their offices on July 25 to those of the Community Federation of Boston on the eleventh floor of the Chamber of Commerce Building. The new address and telephone number are Room 1104, 80 Federal Street, Boston, LIberty 8515.

## SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

### CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, AUGUST 10, 1936

Saturday, August 15—

\*10 a. m. - 12 m. Staff Rounds at the Peter Bent Brigham Hospital. Conducted by Dr. Reginald Fitz.

\*Open to the medical profession.

August 24-29—Harvard University Tercentenary Celebration. See page 1166, issue of June 4.

September 4 to 8—First Congress of the Austrian Society for the Study of Roentgenology. For details address Allgemeines Krankenhaus, Alserstrasse 4, Wien IX, before September 1.

September 7-10—International Union against Tuberculosis. See page 554, issue of March 12.

September 7-11—American Congress of Physical Therapy will meet at the Waldorf-Astoria, New York City. See page 52, issue of July 2.

September 9 to 12—Sixth Congress of the International Society for Urology. For details address Dr. Theodor Hryntschak, Rathausstrasse 3, Wien I.

September 14 and 15—Tercentenary Session of the Harvard Medical School. See page 1166, issue of June 4.

September 16-21—First International Congress of Sanatoria and Private Nursing Homes. See page 803, issue of April 16 and notice elsewhere on this page.

September 22, 23, 24—Twelfth Clinical Congress of the Connecticut State Medical Society. See page 217.

October 12-18—Third International Congress on Malaria. See page 1076, issue of May 21.

October 19-23—Clinical Congress of the American College of Surgeons. See page 180, issue of January 23.

October 19-31—1936 Graduate Fortnight of the New York Academy of Medicine. See page 1221, issue of June 11.

October 20-22—Academy of Physical Medicine, Annual Meeting, Hotel Statler, Boston.

October 20-23—The American Public Health Association. See page 1226, issue of June 11.

March 30-April 2, 1937—First International Conference on Fever Therapy. Postponement notice. See page 52, issue of July 2.

April 21-24, 1937—American Society for Experimental Pathology. See page 1075, issue of May 21.

## BOOK REVIEW

Transactions of the American Gynecological Society. Volume 60. For the year 1935. Edited by Otto H. Schwarz. 853 pp. St. Louis: The C. V. Mosby Company.

This sixtieth volume of transactions presents the proceedings of the Society at its annual meeting in Virginia on May 27, 28, 29, 1935. Its chief interest lies in the twenty-one original papers read. Notable among these are two by Mr. Victor Bonney of London on the treatment of carcinoma of the cervix by Wertheim's operation (illustrated by a series of nineteen admirable cuts), and on the extended scope of myomectomy in the treatment of uterine fibroids. Boston readers will also be particularly interested in Dr. Louis E. Phaneuf's paper on the place of coelpectomy in the treatment of uterine and vaginal prolapse, and in Dr. Newell's excellent obituary of Dr. Walter L. Burrage.

creased markedly both for total attendance and for cancer patients. There is less medical "shopping" as evidenced by the increased percentage of patients being referred by the first physician consulted. While the cancer deaths in the State over the nine-year period showed a 19 per cent increase both the clinic attendance and the admissions to Pondville have shown far greater increases, indicating that the use of facilities for diagnosis and treatment is increasing to a much greater extent than the disease itself.

TABLE 3

PERCENTAGE OF CANCER PATIENTS ATTENDING THE CLINICS ALIVE AT YEARLY INTERVALS FOLLOWING CLINIC ADMISSION

Number of cancer patients	5422
Percentage lost and unknown	5.6
Alive 1 year after	66.5
Alive 2 years after	53.0
Alive 3 years after	45.8
Alive 4 years after	40.8
Alive 5 years after	36.4
Alive 6 years after	32.8
Alive 7 years after	30.1
Alive 8 years after	24.3

Table 3 shows the percentage of cancer patients alive after various intervals of time following their admission to the clinics. While this table does not indicate necessarily the percentage of cures, it points toward either cure or at least prolongation of life in most of the 24.3 per cent of cancer cases attending the clinics alive at the end of eight years. An unpublished study of untreated cancer showed only 0.7 per cent of the cases alive at the end of the same interval of time.

The change in the educational work followed the reorganization of the clinics. It was recognized that the general education in cancer that had gone on for eight years was excellent because it had laid the foundation in the public mind for the acceptance of the more specific and personal instruction which would have to follow before the results of education could be really felt.

The physician must be the pivotal figure in cancer control. With this in mind, the organization in every city and town in the State of a co-operative cancer control committee was be-

gun. Each of these committees includes representatives of all organizations in the community—social, racial, religious, fraternal, service, military, and political. Each individual member is asked to arrange with the organization that he represents for at least one meeting a year at which cancer will be discussed by one of the local physicians. A central committee is formed to take care of administrative details. An important feature stressed is that the meetings be sufficiently small to encourage free and informal discussion.

Every physician in the State has received a copy of the cancer number of *The Commonwealth* in which were thirty-one articles by specialists on various types of cancer as well as general historical and statistical material. Other literature is sent upon request. Monthly bulletins composed of abstracts of current articles on various phases of cancer are sent to physicians throughout the State.

This program is mutually instructive; the physician has to keep abreast of the subject of cancer so that he can teach and answer questions and the layman learns from the physician.

In 1935, through additional legislative appropriations, the Greenfield clinic was reopened, clinics were established at the Beth Israel Hospital in Boston, at the Cooley Dickinson Hospital in Northampton, at the Addison Gilbert Hospital in Gloucester, and at the Anna Jaques Hospital in Newburyport. Plans are now under way for two new clinics, one at Hyannis and the other at Fall River.

The new clinics, up to the present time, are showing better attendance per population than any of the other clinics with the exception of Pondville. Practically all of the cases in the new clinics are coming from physicians.

The medical profession in Massachusetts and the State Department of Public Health have shown in this cancer program what can be accomplished by complete co-operation. In no better way can the medical profession render service and maintain its traditional standing with the public than by showing, as it has, a willingness to take advantage of the facilities provided by the State and make use of them for the benefit of patients who otherwise could not obtain the best diagnostic aids or hospital treatment.

ent time bed facilities for this disease are inadequate

Antedating the present cancer program by several years, a Tumor Diagnostic Service has been maintained by the Department in conjunction with the Harvard Cancer Commission. Any physician or hospital may have suspicious tissue examined to determine the presence or absence of cancer. Approximately 2500 specimens are examined yearly, and there is a steadily increasing number of inquiries from the physicians regarding the most satisfactory treatment of many types of tumors.

Research is primarily of a statistical nature and during the nine years of the program has covered questions on care and treatment of cancer patients, as well as factors dealing with the etiology of the disease.

In the early part of the program, group consultation in the clinics was suggested but was not adopted in most cases. Social service has been an integral part of the clinics from the beginning. A uniform record system giving social data was required of all clinics but medical records were inadequate. In some cities the clinic activities were divided by several small clinics being held in separate hospitals.

Educational committees were formed in the clinic cities. Their main object was to impress the public with the early signs of cancer, the danger of delay, and the use of modern facilities for care and treatment. This was done largely through newspaper articles sent to the committees by the Department. The radio was used frequently. Throughout the program special cancer days or weeks were held. Some of these were in the clinic cities and others were State-wide.

In the fall of 1934 the whole cancer program was reviewed and efforts were made to correct its shortcomings. Steps were taken to reorganize the clinics. Group consultation was made mandatory in all clinics, and cities having the clinics divided among several hospitals were urged to unite at one hospital. The three Pittsfield clinics united at the St. Luke's Hospital. The clinic at North Adams, which originally was a part of the Berkshire County clinic, separated and became the North Adams clinic. The Newton clinic was abolished due to the small attendance. The Worcester clinic, which met in six hospitals, united at the Memorial Hospital. The Worcester North clinic separated into the Fitchburg and Gardner clinics. The Springfield clinic, which had previously been in three hospitals, united at the Springfield Hospital.

The clinics were advised to become consultation clinics for the profession. Prior to this time newspaper material had advised an individual with symptoms of cancer to go to his physician or to a cancer clinic. The advice to

go to a cancer clinic has been discontinued and all educational material now directs the patient to go to his physician. The physicians are advised to use the cancer clinics as consultation centers.

Uniform medical records were demanded of the clinics and special teaching clinics, at least one a year, were also required. At the teaching clinics either the local staff or a consultant brought in from some other locality gives a demonstration clinic for the profession in that locality. There has been an average of three teaching clinics a month for the past six months and present developments indicate a substantial increase in the immediate future.

Physicians are urged to go with their patients to the clinics and avail themselves of this free consultation diagnostic service. In one clinic held recently seventeen patients, all accompanied by physicians, attended.

TABLE 2  
CANCER PROGRAM STATISTICS

	1927	1931	1935
Cancer deaths	5454	5859	6482
Cancer in clinics	305	674	1001
Precancers in clinics	88	213	312
Others in clinics	967	2160	2342
Number of clinics	6	13	18
Number of towns represented	134	224	239
Number of specimens sent to Tumor Diagnostic Service	2550	2530	2575
Admissions to Pondville Hospital	123	907	1186
Beds in Pondville Hospital	90	115	145
Median duration of delay in months between first symptoms of cancer and consultation with physician	6.8	6.4	6.1
Median duration of delay in months between visit to first physician and clinic	5.2	5.8	3.3
Percentage of all patients sent by physicians to clinics	20.1	38.2	58.2
Percentage of cancer patients sent by physicians to clinics	44.8	60.0	74.0
Percentage of patients having seen only one physician before coming to clinic	43.3	49.6	51.8

Table 2 gives the comparison of the clinic statistics for the years 1927, 1931, and 1935, together with similar figures for Pondville and the Tumor Diagnostic Service. The Tumor Diagnostic Service shows little change throughout the period. The duration of delay between first symptoms and first consultation with a physician has decreased slightly over the period but not to the extent desired. The duration of delay between the first visit to a physician and attendance at a clinic has shown a marked improvement in the last four years, but even now this delay is too great. The percentage of patients referred to clinics by physicians has in



for women. Eleven patients with atrophic arthritis have been followed for more than twenty years, 5 of whom are now working. At times the progression of other diseases produced complete disability when the arthritis was quiescent and deformities were not serious.

Hypertrophic arthritis as one would expect showed a greater percentage working than atrophic arthritis. The average age on admission for this group was 57 for both men and

children while it has progressed to severe disability in a small number of patients shows much the same response to therapy as chronic atrophic arthritis in older persons.

The success of the convalescent care of these patients has been dependent upon a number of things. Of first importance has been the thoroughness of the supervision subsequent to discharge. For most patients when acute symptoms have subsided and deformities, if present

TABLE 1 Status of patients

Type of Arthritis	On Admission		On Discharge		Present Time			
	Able to Work	Unable to Work	Able to Work	Unable to Work	Able to Work	Unable to Work	Dead	Cannot Be Traced
Atrophic arthritis including Strümpell-Marie's and Still's disease	66	376	225	206 (21 died)	225	121	77	29
Hypertrophic arthritis	67	131	134	56 (8 died)	115	44	38	1
Chronic gonorrheal arthritis	0	11	8	3	7	1	1	2

women. Their average stay in the hospital was five and one-half months; the average stay for men being about twice that for women. There was a proportionately greater number of deaths in accordance with the usual life expectancy in these older people.

The course in chronic gonorrheal arthritis differed little from the other types of chronic arthritis. Disability in the patients not working was due more to failure in social adaptation than to physical handicap.

Table 2 is a comparison of the response of

TABLE 2 Response to treatment

Type of Arthritis		Number Living	Percentage Working
Atrophic arthritis in adults	Women	225	67
	Men	95	58
Hypertrophic Arthritis	Women	95	83
	Men	64	56
Strümpell-Marie	Women	6	83
	Men	20	70
Still's Disease	Girls	17	71
	Boys	8	63

male and female patients, excluding those who have died and those whose present condition is unknown. What part sex plays in the development of or recovery from the various forms of chronic arthritis is not known. Arthritis of the spine, the so-called Strümpell-Marie type, more commonly seen in men, produces more serious permanent disability than any other type of chronic arthritis. Here early prevention of deformity is the most helpful therapeutic measure. Still's disease, the chronic arthritis of

have decreased so that care of the body and walking are possible, it has been found that the subsequent convalescent care can usually be carried on successfully with the patient at home. It is necessary in most cases to give full written instructions of rest periods and the amount and kind of activity permitted, dietary instructions, directions for medications and for orthopedic exercises or other physiotherapy, as well as for any apparatus worn. The hospital visiting nurse usually visits the patient at home frequently to see that instructions are being followed properly. Any difficulty that the patient is having is reported to the physician in charge of that patient. Before the patient returns to his home a careful study of the home is made by the social service. If the home is too difficult for the patient with his limited physical adaptability, a place in a convalescent home or boarding house is secured temporarily if possible or he is kept in the hospital for a longer period. Frequent visits are made by the patient to the out-patient clinic for examination and advice, and he is readmitted to the wards occasionally for laboratory tests, special medications, plaster casts and occasionally orthopedic operations. Table 3 gives a summary of the follow-up care of these 661 patients.

The greatest number of good end-results were seen in those cases where continuous supervision after discharge was possible. Without constant encouragement and direction the patients who are physically handicapped soon lose hope; they cease to co-operate, they easily become victims of nostrums and irregular practitioners and the inevitable increasing disability which chronic arthritis produces is seen. Those who were cared for by their families

## CONVALESCENT CARE IN CHRONIC ARTHRITIS\*

BY JOHN G. KUHNS, M.D.,† AND ROBERT J. JOPLIN, M.D.†

**C**HRONIC arthritis is a systemic disease with articular symptoms which usually develop slowly and which require a very long time for their complete subsidence. Death or rapid recovery rarely occurs. The repair of the articular lesions occurs slowly and often imperfectly. Recovery of the general health may require an even longer period of time.<sup>1</sup> The disabilities and deformities which often come insidiously in the wake of chronic arthritis may need many months or even years for their correction.

A long period of medical supervision is imperative in the treatment of such chronic disease in order to secure the closest possible approach to normal health and adequate function. It has been shown that chronic arthritis can be brought to quiescence slowly with the therapeutic measures at our disposal.<sup>2</sup> The period of convalescence differs greatly, depending upon the varying factors of fatigue, nutrition, infection, deformity, social and emotional adjustment, and many others.<sup>3</sup> The first subsidence of articular symptoms after prolonged rest rarely indicates a well patient. Recovery scarcely ever takes place so rapidly and completely that supervision can be discontinued in less than two years.

The provision of adequate medical supervision for the long period essential to the rehabilitation of these patients creates a serious problem. In the usual general hospital there is little if any provision for the prolonged hospitalization, for the vigilant aftercare required or for the special therapeutic measures that may be necessary. Often the difficulties of fitting into certain economic and social patterns in the face of physical limitations become apparent only after leaving the sheltered environment of the hospital. Many patients with chronic arthritis do not recover full function even after extensive surgery, and adjustments to permanent disabilities must be made.<sup>4</sup>

Cure in chronic arthritis, as in tuberculosis, is never assured. Quiescence throughout life is commonly found, but there is no certainty that a recrudescence of symptoms will not occur. We believe that there are a number of medical and hygienic measures which will make the continuance of this quiescence of the disease more certain. Without diligent guidance of the patient many factors can produce a recurrence

of symptoms which may go on to even more serious crippling. During convalescence there should be medical supervision with an attempt to obtain continuous improvement in the general health and in articular function, at times improvement of the home environment, aid in social adjustment and vocational guidance and the encouragement of a healthy mental outlook.

This study of the convalescent care given by the Robert Brigham Hospital to patients suffering from chronic arthritis shows that there has been a steady growth both in its intensiveness and the fullness of its scope. We are convinced that the task of keeping the ambulatory patient free from articular symptoms and able to carry on some useful work is the most important and the most difficult one for the physician or institution treating chronic arthritis. The end-results tabulated do not represent a true cross-section of the recovery in chronic arthritis,<sup>5</sup> since very few early cases have been treated. Most of the patients were sent to the Robert B. Brigham Hospital by their physicians only after they had become completely helpless. All were from the lowest economic stratum.

There were 661 patients suffering from chronic arthritis who were discharged from the wards of the hospital up to one year ago or longer. There were 423 females and 238 males, 452 were diagnosed as atrophic arthritis, 198 as hypertrophic arthritis and 11 as chronic gonorrheal arthritis.

Table 1 summarizes the condition of these patients on admission to the hospital, on discharge from the hospital and at the present time.

The average stay in the hospital was eleven and one-half months for atrophic arthritis with the average for men and women being about the same. The figures show that about two thirds of the living patients with atrophic arthritis are working. We classed as working only those who have returned to their previous occupations or were able to maintain economic independence. The figures of the present status of patients with atrophic arthritis show no improvement from the time of discharge. This has been due in part to inadequate aftercare. There has been a decided increase in the number returned to work following discharge from the hospital in the past few years through more intensive supervision in the home and the outpatient clinic. Moreover, a number of these patients were beyond middle life when they entered the hospital, and they have many of the disabilities incident to old age. The average age for the cases of atrophic arthritis on admission to the hospital was 37 for men and 38

\*From the Robert Breck Brigham Hospital. Read in abstract at the clinical meeting of the American Society for the Study and Control of Rheumatic Diseases, May 11, 1936, at Milwaukee.

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trophic arthritis there is little tendency to rapid progression or to extensive deformity. Quite different were the findings in the patients with atrophic arthritis. Here, while the disease was rarely brought into quiescence rapidly, much articular damage was prevented when the patients came for treatment in the early stages of the disease. Deformities were far less extensive and severe, and this alone made the convalescent care much easier. While much can be done in the surgical rehabilitation of those who are seriously crippled, there are a number of deformities which must be considered as permanent.<sup>13</sup> Fifty-four of these patients were readmitted to the hospital, after the arthritis had become quiescent, for operations to improve articular function.

A large number of the patients who do not follow medical counsel or who are supervised inadequately after the chronic arthritis is apparently quiescent will have a recurrence of the arthritic symptoms.<sup>14</sup> Ninety-three of the cases of atrophic arthritis and thirty-six of those with hypertrophic arthritis had a relapse after freedom from articular symptoms. In many of these no definite single cause could be established. In certain cases it followed a prolonged breaking away from the hygienic régime which the patient had been following, in others it followed fatigue or long-continued strain. A few relapses occurred with the development of an acute infection. For such recrudescence of symptoms, as well as for other therapeutic procedures, there were 153 readmissions for those suffering from atrophic arthritis and 62 for those suffering from hypertrophic arthritis. As a rule prolonged hospitalization was not necessary for such recrudescence of symptoms. In a few instances, however, the disease which had recurred went on to serious permanent disability.

Death is a not unwelcome release to those seriously crippled by chronic arthritis. There were 76 deaths in those with atrophic arthritis and 38 deaths in hypertrophic arthritis. Pneumonia, myocarditis and nephritis were the usual causes of death in atrophic arthritis, as table 5 shows. In hypertrophic arthritis death was due to the causes found commonly in old age. The frequency of postoperative deaths shows that there is more than the average risk in operative procedures upon these individuals. Death in two instances was due postoperatively to fat embolism. In a small percentage of patients suffering from chronic arthritis, rapid progression of the disease and death from an intercurrent infection take place as Nissen<sup>15</sup> has shown. But, as a rule, once arthritis has become quiescent, there is no greater morbidity among these patients than among other members of the community.

It has long been known by students of chronic arthritis that the home environment is very important both for the development of chronic arthritis and in its influence upon the convalescence.<sup>16</sup> In the histories where sufficient data were available the home was of good type in 248 of the cases of atrophic arthritis and in 111 of those of hypertrophic arthritis. It was fair in 87 of the cases of atrophic and in 29 of those of hypertrophic arthritis.

TABLE 5 Causes of death.

Disease	Atrophic Arthritis	Hypertrophic Arthritis
Pneumonia	18	5
Myocarditis	13	8
Nephritis	11	2
Postoperative	6	2
Neoplasms	3	6
Blood diseases	4	1
Arteriosclerosis	4	3
Septicemia	4	0
Pulmonary tuberculosis	3	1
Urinary infections	3	2
Cerebral hemorrhage	2	2
Diabetes	1	1
Coronary disease	1	1
Endocarditis	2	0
Fracture cervical spine	1	0
Aortitis and aneurysm	0	3
Bronchiectasis	0	1
	76	38

The home was classed as unsatisfactory in 39 histories of atrophic arthritis and 10 histories of hypertrophic arthritis. In the others it was not mentioned. Much of this was inadequate social data, for many other factors are of great moment besides the location, commodiousness and cleanliness of a house. Many cases of arthritis have occurred in such homes in the face of hidden domestic friction, economic pressure, unmentioned fears and maladjustments. This has been brought much more forcibly to our attention since the onset of the depression. If the physician or the hospital can use the various social agencies available to make the home situation not only comfortable but peaceful as well, much will have been done to speed the recovery.

Only recently have we become aware of the hidden potentialities for useful service in those who are permanently handicapped. If the patient with inactive arthritis cannot be returned to his former occupation, some other may be found fitted to his limitations, but still adequate to his economic needs and his self-respect.<sup>17</sup> Recent legislation in a number of the states has made it possible for the handicapped to learn some other trade or calling. At the Robert B. Brigham Hospital we have used these facilities to the full extent only in the

ily doctor or were under no supervision fared less well. Not all patients who refuse medical advice will eventually become bedridden invalids.<sup>8</sup> Spontaneous improvement does occur occasionally. The reparative forces of nature are not idle and even in the most serious cases some healing is seen. But this will progress most rapidly and completely when the patient

TABLE 3 Supervision

	Atrophic Arthritis		Hypertrophic Arthritis	
	Num-ber	Per-cent-age Work-ing	Num-ber	Per-cent-age Work-ing
Followed in out patient service	252	77	140	81
No supervision	85	48	32	70
Cared for by family doctor	48	42	16	70
Died in hospital	21	—	8	—
Custodial care in institutions	18	—	8	—
Cared for by other hospitals	28	—	4	—

is following an hygienic régime and when all the proper medical and orthopedic procedures are carried out to hasten recovery.<sup>9</sup>

Most patients with chronic arthritis must of necessity be cared for by their family physicians. Even for the early diagnosis and treatment of these patients there are not adequate facilities for hospitalization such as there are for tuberculosis and psychiatric disturbances. Unfortunately, the family physician fails only too often in interest, in adequate knowledge or in necessary therapeutic equipment. One therapeutic procedure, either medical or physiotherapeutic, is tried to the complete exclusion of the many other immediate therapeutic needs which the patient presents. Practically nothing is done for the prevention or correction of the deformities, and increasing helplessness usually results.<sup>10</sup>

Another factor of great importance in the convalescent care has been the number of other diseases and disabilities found in these patients.<sup>11</sup> Organic disease may at times be of little significance in the treatment of chronic arthritis at other times it may hinder or entirely prevent recovery. Almost one-half of the patients suffering from atrophic arthritis and over 90 per cent of those suffering from hypertrophic arthritis had serious organic disease, exclusive of the joints, at the time of discharge from the hospital. The most serious complication, as shown in table 4, was the rapid devel-

opment of arteriosclerosis. Clinical signs as well as marked calcification in roentgenograms have been seen even in young children. These arterial changes with increasing hypertension have frequently produced serious myocardial and renal lesions.

Nephritis and myocarditis have most frequently been the additional factors producing disability in these patients. Obesity, at times associated with endocrine disturbance or faulty dietary habits, has often been found. Venereal disease has been present more often as a secondary disease than as a cause of the chronic arthritis. Mental disturbances of the less serious sort in the early stages of the disease, such as depressions and maladjust-

TABLE 4 Diseases complicating convalescent care

Disease	Atrophic Arthritis	Hypertrophic Arthritis
Arteriosclerosis	41	69
Nephritis	22	9
Hypertension	19	33
Obesity	17	30
Myocarditis	16	7
Gonorrhea	12	1
Rheumatic heart disease	10	0
Psychoses	9	3
Pulmonary tuberculosis	8	2
Urinary infections	7	3
Syphilis	7	2
Pregnancy	6	0
Endometritis	6	0
Malignant neoplasms	5	6
Endocrine diseases	5	4
Diabetes	4	6
Deformities (not arthritic)	4	8
Pernicious anemia	2	1
Coronary disease	2	1

ments, are the rule.<sup>12</sup> Occasionally these go on to full-fledged psychoses. Eight psychoses requiring institutional care were diagnosed in the hospital and 4 developed subsequent to discharge from the hospital. Manic depressive psychoses were most frequent, with paranoia coming next in frequency. Six pregnancies occurred while these patients were being followed subsequent to discharge. In all of them the arthritic symptoms were better during the pregnancy with a more serious recrudescence, at times temporary, of the arthritis after delivery. We believe that, in most instances, active arthritis is an indication for therapeutic abortion. Two patients without any other disease that could be found besides the chronic arthritis have gone on to severe amyloidosis.

No significant difference could be found in the recovery observed in patients suffering from hypertrophic arthritis between those who came into the hospital during the first six months after symptoms had been present and those first seen late in the disease. In hyper-

of the fracture—a violent impingement of the superior and medial border of the astragalus on the tibial epiphysis—is essentially the same. The medial and superior margin of the astragalus strikes and fractures the lower tibial epiphysis, separates the internal malleolus from the rest of the epiphysis and destroys a portion of the cells of the epiphyseal plate. The amount of separation and destruction may be great or small according to the degree of violence of impact.

Haas<sup>4, 5, 6</sup> has shown in his experimental work on epiphyses and epiphyseal plates that destruction of plate cells is followed by an arrested growth. This arrested growth is general or localized according to the character of the fracture and number of plate cells destroyed. In the fracture under discussion the medial fragment (internal malleolus) can, if necessary, be replaced by means of either an open or closed reduction, but the damaged epiphyseal plate cells cannot be replaced or repaired. The crushing and destruction of the plate cells in the line of fracture cause a localized early ossification of the epiphysis with arrested growth of the medial portion of the tibia. The external portion of the tibia as well as the fibula continues normal growth. This type of fracture therefore must invariably be followed by a varus deformity of the ankle which increases as bone growth continues.

The case here reported has been followed closely for six consecutive years after the initial injury, and the changes of bone growth with the resultant deformity of the ankle as well as the secondary deformities of the knee and spine have been observed. The report of this case includes the history, initial treatment, postoperative treatment and an operation for the correction of the deformity of the ankle joint.

#### REPORT OF CASE

**R B** aged eight. While coasting the patient ran into a tree which he struck with the sole of his right foot. He was unable to walk and was taken immediately to a hospital. X-ray films of the right ankle showed a vertical fracture of the lower tibial epiphysis with wide separation of the fragments (fig 1).

The right ankle was manipulated and an attempt made to reduce the fracture. The ankle was immobilized in plaster of Paris. Postoperative x-ray films showed an improvement in the relationship of the fragments which was considered satisfactory (fig 2).

**One and a half years after injury.** The patient reported to a clinic because of the deformity of his ankle. At this time there was marked varus of the ankle. The lower fibular epiphysis was large and prominent. He had no pain but walked with a limp. Measurements from the anterior superior spines to the tips of the internal malleoli showed no shortening of the right leg. Measurements from the anterior superior spines to the tips of the external malleoli showed a slight increase (one quarter of an inch) in length on the right. There were

no other associated deformities. X-rays were taken (fig 3) *Two and a half years after injury.* At this time the child had no pain and he could run and jump



FIG 1 Anteroposterior roentgenogram taken immediately after the injury shows a vertical fracture of the lower tibial epiphysis with separation of the internal malleolus.

without difficulty. There was a moderate functional varus curve. The varus deformity was more pronounced and he had a definite limp. Measurements of the legs showed one quarter inch shortening of

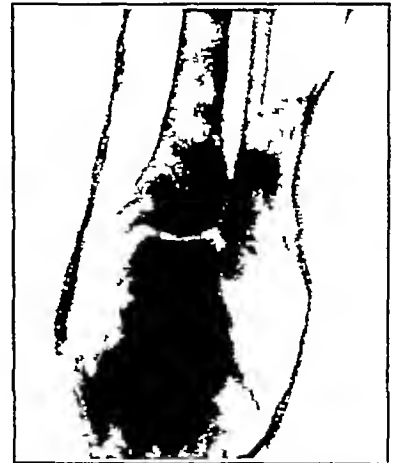


FIG 2 Roentgenogram taken immediately after manipulation of the ankle. This shows the medial fragment in an improved position.

the medial side of the leg and an equal lengthening of the outer side. X-ray films were taken (fig 4).

**Three and a half years after injury.** The deformity appeared the same. The comparative measurements of the two legs were equal to those of a year previously. There was no pain and the child was able to play tennis. The lower fibular epiphysis showed increasing enlargement and there was a definite enlargement of the head of the right fibula and an outward bowing of the right knee. He said

last few years and in less than a dozen patients. Two patients with ankylosis of the spine and bilateral ankylosis of the hips were trained as draughtsmen. Two others showed an aptitude for commercial drawing. One girl with extensive deformities and ankyloses, but indomitable courage, was an honor student in an art school until her death from tuberculosis. Various placement agencies have been utilized by the social service department to find employment for the less gifted and less intelligent patients as elevator operators, night watchmen, clerks, telephone operators and so forth. Stroud<sup>18</sup> has well said that no country can call itself civilized which does not use its employable cripples.

This paper is no attempt to parade accomplishments in the comprehensive treatment of chronic arthritis. It is rather a statement of the many-sidedness of the problem with possible further developments in therapy. When, if ever, we shall be able to prevent chronic arthritis or bring it quickly into quiescence, then these problems will vanish. But until that time we shall have those handicapped by arthritis with us. Undoubtedly state sanatoria must be erected or community funds must be provided for the long hospitalization which many of these patients usually need. In many instances the family doctor working with established social agencies and medical consultants will find adequate facilities at his command. With our present knowledge of the causes and the therapy of chronic arthritis, while it is still incomplete, few permanently handicapped or economically unfit individuals with chronic arthritis should remain in any community.

#### CONCLUSIONS

1 A survey of the convalescent care of 661 patients suffering from chronic arthritis is given. A large number have been returned to economic independence.

2 The success of convalescent care has de-

pended upon 1 The closeness and completeness of supervision of the patient subsequent to discharge from the hospital. 2 Good treatment begun in the early stages of the disease to prevent articular damage. 3 The early recognition and treatment of complicating diseases.

3 Many factors besides the purely medical ones must be considered. The home and the social adjustment of the individual are extremely important. They alone may prevent full recovery.

4 The responsibility of the community does not end when the disease has become inactive. Training, vocational guidance and placement of those handicapped who can be employed are not only duties but are also economically profitable to the community.

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## REPORT OF A CASE OF VERTICAL FRACTURE THROUGH THE LOWER TIBIAL EPIPHYSIS DURING THE PERIOD OF BONE GROWTH AND AN OPERATION FOR THE CORRECTION OF THE RESULTANT DEFORMITY

BY ROBERT H. MORRIS, M.D.,\* AND F. HAROLD DOWNING, M.D.<sup>†</sup>

**V**ERTICAL fractures through the lower tibial epiphysis sustained during the period of bone growth, although comparatively rare, have been previously reported.<sup>1,2,3</sup> This type of fracture is an entity comparable to a Pott's or Colles' fracture. The mechanism of its produc-

tion is always the same and the resultant deformity varies only in degree in each individual fracture. McFarland<sup>3</sup> has reported a series of twenty-three cases which came under his observation over a period of two years. Practically all of these fractures which he reports were sustained in the same way—namely, by a twist at the ankle while the foot was held firmly between the vertical iron posts of a fence. Whether the foot is held firmly or not the mechanism

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A more perfect alignment of the fragments could have been obtained by an open reduction, but such a procedure would have caused further destruction of plate cells and a resultant larger area of arrested growth in the tibia. It therefore seemed advisable to be satisfied with what was accomplished by one gentle manipulation.



FIG 7 Roentgenogram—5 years following injury

The deformity was very marked and the possibility of an osteotomy was considered at the time of his visit one and a half years after injury. There was, however, no pain and the child was able to take part in all the activities of a child of his age. Operative correction of the deformity was therefore deferred until he had attained full bone growth or until such time as the deformity became a handicap to him or produced secondary deformities of the knee and spine.

Comparative measurements taken from the anterior superior spines to the tips of the malleoli showed a total growth of seven and a half inches over a period of five years. These measurements also showed one half inch shortening of the medial side of the right leg and an equal lengthening of the lateral side at the end of this period. Considering that these six years, from the age of nine to the age of fourteen, represent the period of greatest bone growth, the amount of shortening due to arrested bone growth was small and does not entirely account for the 45° varus tipping of the ankle mortise. The overgrowth of the fibula and weight bearing also played a definite part in producing the deformity. At the age of fourteen and a half years the instability of the ankle and knee joints and the increasing deformity at the knee made it necessary to recom-

mend operative correction of the deformity of the ankle, although it was recognized that further bone growth was to be expected.

The correction of this deformity has in the past been accomplished in several ways:

- (1) A wedge osteotomy through the fibula and outer two-thirds of the tibia (McFarland). This method corrects the deformity but leaves the affected leg shorter than the normal one.

- (2) Wedge osteotomy of the tibia with obliteration of the remaining epiphyseal line of tibia and the destruction of the lower fibular epiphyseal line. This method again produces permanent shortening of the affected leg.

- (3) Wedge osteotomy of the tibia with destruction of the epiphyseal line at the lower end of the fibula and tibia of both legs.

- (4) Repeated linear osteotomy during the period of bone growth. This method also produces a permanent shortening of the affected leg.

The operation described below was devised and performed in an attempt to correct the deformity and provide legs of equal length.

**Operation.** The lower third of the right tibia was exposed by an incision four and a half inches long parallel and lateral to the crest of the tibia. The periosteum was then incised in the line of the skin incision and separated by blunt dissection from around the tibia. About one inch above the lower epiphyseal line of the tibia the periosteum and interosseous membrane were divided horizontally. A step osteotomy was then done on the tibia, leaving three inches between the steps and the lower step about one and a half inches above the lower epiphyseal line (fig 8A). A simple osteotomy of the right fibula was done through an incision one and a half inches long over the outer side of the leg. The upper and medial corner of the lower fragment was then removed to prevent too great pressure on the soft tissues of the leg when the foot was put into a corrected position. With a hand drill three No. 30 hardened steel pins were inserted—one through the os calcis and the other two through the upper fragment of the tibia just above the line of incision. The two upper pins were parallel to one another and at right angles to the long axis of the tibia. The lower pin was at right angles to the vertical plane of the os calcis (fig 8B). The periosteal tube could not be sutured over the bone. The wound was closed with interrupted plain catgut for the subcutaneous tissue and black silk for the skin suture. The three pins were then fitted with a leg lengthening apparatus which was set to hold the foot in a corrected position under slight tension (fig 8C).

**Postoperative notes.** The patient had considerable pain for the first three days. On the fourth day the pain subsided and lengthening was begun. Practically all the increased tension was put along the medial side of the leg so that the deformity could be overcorrected and the increased length applied to the tibia. At the end of two and a half weeks the wound was healed and the sutures were removed. Measurements showed an increase of three quarters of an inch in length of the inner side of the leg and the foot was in an overcorrected position. A long leg plaster cast was applied incorporating the pins and the lengthening apparatus was removed (fig 8D). Eight weeks after



that he "turned over" on his right ankle and that he could not always depend on it. X-ray films were taken (fig 5).

*Four and a half years after injury* At this time he had no pain and was engaging in normal activi-

*Five and a half years after injury* The patient complained that he could not depend on his ankle when attempting strenuous exercises. Comparative measurements of legs showed no change over the previous year. The head of the right fibula was



FIG 3 Anteroposterior view taken 1½ years after injury shows an area of ossification at the site of the fracture. The lower fibular epiphysis is beginning to enlarge and is slightly inverted.

The foot as a whole is in slight varus.

ties. He had sprained his ankle several times during the year. The head of the right fibula was slightly more prominent than the year before. Measurements from anterior superior spines to the



FIG 4 Anteroposterior view taken 2 years after injury shows a further increase in the deforming factor and also definite evidence of arrested growth of the medial portion of the tibia.

tips of the internal malleoli showed one half inch shortening on the right. Measurements from anterior superior spines to the tips of the external malleoli showed one half inch lengthening on the right. X-ray films were taken (fig 6).



FIG 5 Anteroposterior view taken 3½ years after injury. This roentgenogram shows further increase in area of ossification and shortening of inner portion of tibia, tilting of the ankle mortis into varus, enlargement of lower fibular epiphysis with a widening of the epiphyseal line.

much enlarged, prominent and tender. The functional scoliosis had increased markedly in the last year. Operation was advised. X-ray films were taken (fig 7).



FIG 6 Roentgenogram taken 4½ years after injury shows increase in all the deforming factors.

The mechanism of the fracture in this case was the violent upward thrust of the inverted astragalus against the lower tibial epiphysis, which is the same mechanism as McFarland described in the twenty-three "fence fractures" he reported.



FIG 6 Roentgenograms in the anteroposterior lateral position taken three weeks postoperatively

The varus deformity has been corrected there is increase in the length of the tibia The alignment as shown in the lateral view is good

#### SUMMARY

(1) The mechanism of production of vertical fractures through the lower tibial epiphysis is always the same and the invariable resultant deformity when this fracture is sustained varies only in degree

(2) The slowly developing deformity is due to the arrested growth of the medial portion of the tibia. This arrested growth is the result of the destruction of epiphyseal plate cells

(3) The initial treatment of this type of

fracture is careful manipulation and immobilization Repeated violent manipulations or open reduction for the purpose of procuring exact replacement of the fragments is contraindicated because by so doing there may be further destruction of the epiphyseal plate cells

(4) The indication for operative measures to correct this deformity before the completion of bone growth is as follows (a) instability of the ankle or knee or (b) an increase in the severity of the secondary deformities of the knee and spine

(5) Previous operations for the correction of this deformity sacrifice the length of one or both legs The operation here described corrects the deformity and maintains the normal length of the leg

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## DEHYDRATION THERAPY IN THE TOXEMIAS OF PREGNANCY

### A Report of Sixty-Five Cases

BY G ELLIOTT MAY M D \*

THE newer theories concerning the etiology of eclampsia and its precursor preeclampsia seem to indicate that the disease is of endocrine origin possibly pituitary but more probably placental Blood studies usually show an increase in prolactin and a decrease in estrin in the toxemic patients Local vasospasm of the terminal arterioles seems able to account for the pathological findings in the various organs and also to account for the newer concept that eclampsia is not a disease primarily of the liver or of the kidneys but rather of all the small terminal arterioles Whether this vasospasm is local or central in origin or both, still remains to be proved Likewise whether or not it is a prolactin or other endocrine effect also is unsolved

In addition to vasospasm there is also an upset in water balance in toxemias This disturbance in water balance which results in fluid

retention in the body can be accounted for at least in part by arteriolar spasm especially the glomerular arterioles of the kidneys

Fluid retention alone probably does not account for all the symptoms of toxemia nevertheless it does seem to produce or at least aggravate some of them Edema of the body and extremities is the most obvious example of the retained fluid Oliguria is another Passive congestion of the kidneys produces albuminuria and can cause the appearance of red and white blood cells in the urine Increased intracranial pressure from cerebral edema can account for hypertension headaches blurred vision scotomata and finally coma and convulsions On the other hand it is also true that localized vasospasm can account for the hypertension and vasospasm of the retinal arterioles can cause the ocular symptoms

Emphasizing the importance of fluid retention as a causative factor in the production of

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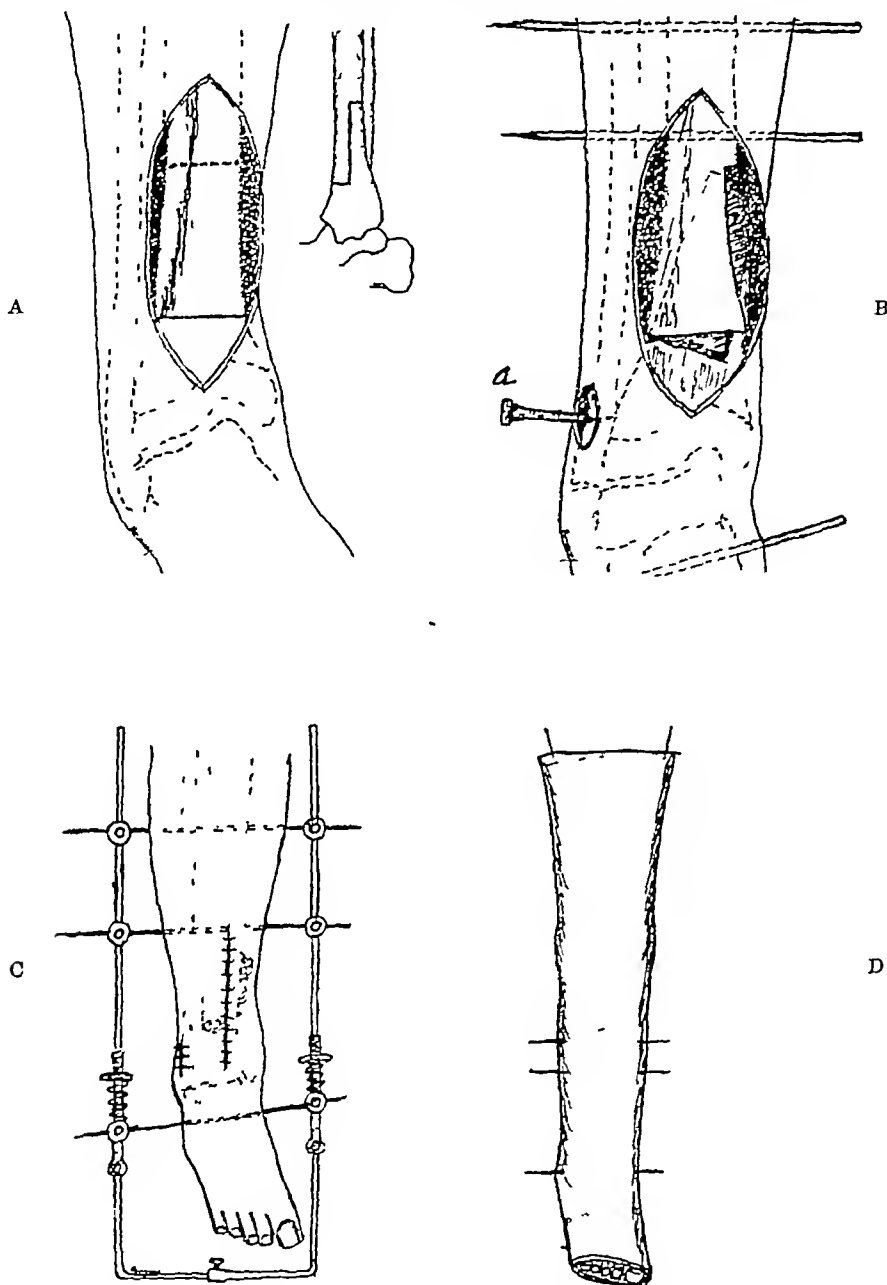


FIG 8A The diagram shows the anterior and posterior view of the step osteotomy of the tibia

FIG 8B Osteotomy of tibia and fibula completed Pins in place with foot partially corrected (a is the osteotomy in the incision through which the osteotomy of the fibula was done)

FIG 8C In this diagram the lengthening apparatus has been applied to the pins

FIG 8D The leg and pins are here incorporated in a long leg plaster cast

operation the pins were removed and a short leg plaster was applied. Excellent bony union could be demonstrated both clinically and by x-ray films (fig 9). Slight weight bearing with crutches was allowed.

At the end of twelve weeks the anterior portion of the plaster was removed and physiotherapy and active exercises were begun. This was continued for two weeks at which time he was able to discard the posterior portion of the cast and bear considerable weight with the aid of crutches without pain. A shoe with an outside raise of one quarter of an inch was then worn. By the end of six months he was bearing full weight without support. Measurements at this time showed the medial side of the right leg equal to the left and the lateral side of the right leg one quarter of an inch longer than the left. The ankle joint showed abduction 0° adduction 20° dorsiflexion slightly beyond a right angle and plantar flexion 30°.

## RESULTS

## a Preeclamptic toxemias

The first two charts show the comparison of results obtained in the dehydrated and nondehydrated cases of preeclamptic toxemia. There were twenty cases in each group. None of the dehydrated group developed eclampsia, *abruptio placentae* or macerated the fetus. All but four cases were carried to full term. The first seven cases were the most interesting and their records are given in detail subsequently. Case 8 had been controlled very well in the toxemia clinic and had been taken off dehydration. A week later she entered the hospital with a blood pressure of 160/95 mm and an SPT of albumin. Case 9 went off dehydration two weeks before term and did not return to the clinic. She later entered the hospital in labor with a blood pressure of 180/120 and a HT of albumin. These two cases seem to indicate the advisability of continuing dehydration in toxemias right up to the end of pregnancy in spite of any improvement shown.

In the control group one case developed eclampsia and two cases developed postpartum eclampsia. One case macerated the fetus and there was one stillbirth. Eight cases had to be induced prematurely.

## CASE REPORTS

**CASE 1** Mrs. L. M. a private patient, white, aged twenty-eight years, 1 para, was admitted to the Baker Memorial Hospital on July 13, 1933. Her last catamenia was Nov. 25, 1932, and her expected date of confinement was Sept. 2, 1933. Her past history was irrelevant. With the exception of slight bleeding at two months her pregnancy had been uneventful. At six months an x-ray revealed a twin pregnancy. On July 12, at seven months, the patient's blood pressure was 152/98 mm; the urine was negative but there was slight edema of the extremities. On July 12 the blood pressure had risen to 170/100 mm; there was marked edema of face and extremities and the urine showed a trace of albumin with red and white blood cells and no casts. There were no other toxic symptoms. The patient was referred to the hospital and placed on a strict dehydration régime. Her course was as follows:

Date	In- take	Out- put	Blood Pres- sure	Al- bu- min	Ede- ma
July 13	0	2400 cc	170/100 mm	ST	+++
14	900 cc	2550	150/90	VST	+++
15	1050	2250	130/80	VST	+
16	1050	2220	130/80	VST	+
17	1050	1200	120/80	ST	+

On July 18 the patient ruptured her membranes spontaneously and delivered herself of twins. Her further course in the hospital was uneventful and she was discharged home in two weeks. The twins did very well. It is of interest to note that her output for the three days following delivery totaled 6900 cc, while her intake for that time was restricted to 3600 cc.

**CASE 2** Mrs. M. L. O.P.D. No. 104197, white, aged nineteen years, 1 para, was first seen in the toxemia clinic of the Boston City Hospital on Oct. 15, 1933. Her last period had been on Feb. 12, 1933, and her expected date of confinement was Nov. 19, 1933. Her pregnancy had been uneventful except for occasional headaches and vomiting.

On October 15 her blood pressure was 156/84 mm and her urine was negative for albumin. Dehydration therapy at home was not successful, and on November 13 her blood pressure had risen to 164/96 mm and her urine showed a slight trace of albumin. She was immediately referred into the hospital. On admission her pressure was 170/98 mm and her urine showed a heavy trace of albumin with hyaline and granular casts and red blood cells. Her face and extremities showed moderate edema and she complained of slight headache. Her course was as follows:

Date	In- take	Out- put	Blood Pres- sure	Al- bu- min	Ede- ma
Nov. 13	0	?	170/98 mm	HT	++
14	0	700 cc	150/100 "	ST	++
15	700 cc	800	140/98	0	+
16	500	700	130/80	0	0
17	500	750 "	120/80	0	0
18	500	700 "	138/98	0	0
20	500	720	140/90 "	0	0

On November 23 the patient started spontaneous labor and was delivered by low forceps. Her puerperium was uneventful and she and the baby were discharged in the ordinary time. Her blood pressure on discharge was 120/98 mm and the urine showed no albumin.

**CASE 3** Mrs. A. W. No. 713740, white, aged twenty-seven years, 3 para, was referred into the Boston City Hospital from the O.P.D. on June 26, 1933. Her expected date of confinement was July 11, 1933. She had had two previous normal full-term deliveries and her present pregnancy had been uneventful. She was placed on a dehydration régime and progressed as follows:

Date	In- take	Out- put	Blood Pressure	Albu- min	Ede- ma
June 26	0	—	170/100 mm	ST	+++
27	0	400 cc	150/110	SPT	++
28	300 cc	500 "	140/100	SPT	+

Her fluids were balanced at 350 cc intake but her blood pressure remained around 140/90 mm and she continued to show a slightest possible trace of albumin. Hence on July 3 she was given castor oil and quinine and labor ensued promptly. Normal delivery occurred on July 4. The patient had a normal puerperium and was discharged home in ten days albumin-free and with a blood pressure of 118/80 mm.

**CASE 4** Mrs. N. F. No. 713735, colored, aged thirty-three years, 4 para, was referred into the Boston City Hospital from the O.P.D. on June 26, 1933. She had had three normal full-term pregnancies. Her expected date of confinement was Aug. 19, 1933. Her present pregnancy had been uneventful except for occasional dizzy spells until June 10, at which time her blood pressure was found to be 148/104 mm and there was slight albuminuria. She was not sent into the hospital until June 26. On admission she showed no edema or toxic symptoms. The blood chemistry was normal and the urine sediment showed hyaline and

the symptoms of the eclamptic syndrome, Arnold and Fay in the August, 1932, issue of Surgery, Gynecology and Obstetrics presented a very excellent paper on the value of fluid limitation in the treatment of the pregnancy toxemias. In addition to case reports on ten patients, they gave an interesting discussion concerning the rationale of this type of therapy.

Forcing fluids on the already "water-logged" patient has seemed futile if not actually harmful, and Arnold and Fay's dehydration therapy seemed very sound in principle. Hence this series of sixty-five cases has been cared for in the manner they recommended and the results are herewith presented.

Most of the dehydrated cases presented in this series were cared for by the toxemia service of the Boston City Hospital. The rest were patients from the obstetrical service of the Newton Hospital and private patients. The control group was made up of patients cared for in the last two years at the Boston Lying-in Hospital and the Boston City Hospital.

#### CLASSIFICATION

In classifying these cases as preeclamptic toxemias or as mild or severe chronic nephritic toxemias, it is obvious that at times a case may have been incorrectly grouped. Too often the differential diagnosis between preeclampsia and nephritis is impossible until a subsequent pregnancy has given the kidneys the best renal function test. Realizing this, nevertheless an attempt has been made to classify the various cases and to this end, cases were considered chronic nephritis which conformed most closely to the following signs and symptoms:

- 1 Elevated blood nonprotein nitrogen
- 2 The toxemia appearing before the fifth month of pregnancy
- 3 A history of a previous pregnancy toxemia
- 4 A history of previous predisposing diseases, as scarlet fever
- 5 Albuminuric retinitis
- 6 Moderate secondary anemia
- 7 Blood pressure over 160 mm systolic with little or no albuminuria
- 8 Slowness or failure of the blood pressure and urine in returning to normal during the puerperium
- 9 Impaired renal function tests

Differentiation of the mild and severe nephritics was made arbitrarily by considering the height of blood pressure and amount of albuminuria together with the general clinical appearance of the patient and course of the disease.

#### TREATMENT

In caring for the outpatient cases, a very detailed toxemic history was taken, and each pa-

tient received the following printed instructions:

1 From six o'clock tonight until six o'clock tomorrow night, save, measure and record the total amount of urine that you pass. During this period do not take any more than four glasses of any kind of fluid.

2 The next day restrict your total fluid (water, tea, coffee, milk, beer, soups, fruit juices) intake to one glass less than the total urine passed.

3 Similarly each day keep track of the urine voided and during the succeeding day take one glass less of fluid, aiming always to take in less fluid than you have passed urine.

4 Keep a daily record of the urine output and fluid intake and bring this record to the clinic with you at each visit.

5 Take one or two teaspoonfuls of Epsom salts every morning so that you will have from two to four loose bowel movements each day.

6 Use no salt on your food.

7 Eat meat once a day.

8 Eat no sweets or desserts.

9 Eat four small meals a day.

10 Do not eat or drink between meals.

The treatment of the hospitalized patients was carried out along similar lines. Exceptions were, that the severe cases received no fluids at all during the first twenty-four hours and the amount of catharsis was increased. Occasionally the severe case received either 100 cc of 50 per cent glucose solution or 20 cc of 10 per cent magnesium sulphate solution intravenously. Protein foods were allowed in moderation. The fluid given with the Epsom salts orally was not included in the recorded intake because most of it is eliminated in the watery stools secured.

By these procedures, the level of fluid intake is placed at the point of maximum renal efficiency. There is, in addition, enough fluid in the food content to compensate for that lost in skin, breath and bowel elimination. The mild purgation assists in withdrawing tissue-bound fluid from the interstitial spaces, not only in the extremities but within the cerebral structures as well.

It has not been found necessary to continue dehydration after delivery as Arnold and Fay recommended. Their method was not used on cases admitted with actual eclampsia, because it was felt that the process of dehydrating a patient required too long a time to be of value in the convulsive case.

The control cases were treated by the old recognized methods, chiefly a low protein, salt-free diet, saline catharsis, fluids *ad lib* or forced and sedatives.

CHART 2  
PREECLAMPTIC TOXEMIAS  
Nondehydrated Group

Case	Para	Age	Treatment Started				Finished			Labor	Baby	Discharge		
			Dura tion of Preg Mo	B P	Alb	Ede- ma	B P	Alb				B P	Alb	
1	1	25	S	135	ST	+	150	HT		Sp FT	OK	120		0
				85			90					80		
2	1	22	S <sup>1</sup> / <sub>2</sub>	140	ST	+	126	HT		Sp FT	OK	N		0
				110			76							
3	1	19	S <sup>1</sup> / <sub>2</sub>	145	ST	0	145	ST		Sp FT	OK	N		0
				95			95							
4	1	19	S <sup>1</sup> / <sub>4</sub>	162	T	+	60	T		In S <sup>1</sup> / <sub>2</sub>	OK	N		0
				110			110							
5	1	28	7	170	HT	+	20	SPT		Sp 7 <sup>1</sup> / <sub>4</sub>	Mac	N		T
				120			90							
6	9	46	7	?	?	++	65	HT		In 7 <sup>1</sup> / <sub>4</sub> Eclamp	OK	N		?
							95							
7	1	28	S <sup>1</sup> / <sub>2</sub>	148	T	+	60	T		In S <sup>3</sup> / <sub>4</sub>	OK	N		0
				100			10							
8	1	20	S <sup>3</sup> / <sub>4</sub>	160	HT	+	60	VHT		In FT	OK	N		0
				110			10							
9	1	20	S <sup>1</sup> / <sub>2</sub>	154	0	—+	170	T		In S <sup>3</sup> / <sub>4</sub> P P Ec	OK	N		0
				94			10							
10	1	21	S <sup>3</sup> / <sub>4</sub>	150	HT	+	60	HT		Sp FT	OK	N		0
				104			115							
11	1	17	S <sup>1</sup> / <sub>2</sub>	160	ST	+	160	T		Sp FT	OK	N		0
				116			110							
12	1	30	S	130	VST	+	150	T		In S <sup>1</sup> / <sub>4</sub>	OK	N		0
				80			90							
13	1	24	7 <sup>1</sup> / <sub>4</sub>	150	HT	++	150	HT		In 7 <sup>1</sup> / <sub>2</sub>	OK	N		0
				120			110							
14	2	24	S <sup>3</sup> / <sub>4</sub>	144	T	+	130	HT		Sp FT	OK	N		0
				90			90							
15	1	26	S <sup>3</sup> / <sub>4</sub>	148	0	+	138	SPT		In FT	OK	N		0
				100			110							
16	1	25	S	136	0	+	170	ST		In S <sup>1</sup> / <sub>4</sub>	OK	N		0
				94			90							
17	1	33	S <sup>3</sup> / <sub>4</sub>	144	VST	+	160	ST		In FT	Dead	N		0
				100			100							
18	1	19	S <sup>3</sup> / <sub>4</sub>	120	HT	+++	154	T		Sp FT P P Ec	OK	N		0
				84			100							
19	1	25	S <sup>3</sup> / <sub>4</sub>	146	SPT	—	140	SFT		In FT	OK	N		0
				105			110							
20	1	18	S <sup>3</sup> / <sub>4</sub>	140	ST	+	140	ST		Sp FT	OK	N		0
				100			100							





CHART 3  
MILD NEPHRITIC TOXEMIAS  
*Dehydrated Group*

Case	Para	Age	Prev Tox	Dehydration Started				Finished			Labor	Baby	Discharge	
				Mo	B P	Alb	Ede- ma	B P	Alb				B P	Alb
1	2	28	+	8	$\frac{154}{102}$	SPT	++	$\frac{128}{90}$	0		Sp FT	OK	N	0
2	5	43	+	$8\frac{1}{2}$	$\frac{170}{102}$	0	0	$\frac{125}{80}$	0		In FT	OK	N	0
3	2	30	+	6	$\frac{140}{80}$	0	0	$\frac{120}{78}$	0		Caes FT	OK	N	SPT
4	8	37	+	$8\frac{1}{2}$	$\frac{142}{100}$	SPT	++	$\frac{155}{110}$	ST		Sp FT	OK	N	0
5	5	35	0	8	$\frac{160}{80}$	SPT	++	$\frac{140}{80}$	0		Sp FT	OK	N	0
6	2	32	0	8	$\frac{192}{134}$	SPT	+	$\frac{180}{124}$	0		In FT	OK	$\frac{115}{100}$	0
7	9	31	+	7	$\frac{170}{92}$	SPT	0	$\frac{164}{90}$	0		Sp FT	OK	N	0
8	4	35	+	6	$\frac{154}{104}$	0	0	$\frac{142}{40}$	SPT		Sp FT	OK	$\frac{148}{90}$	0
9	4	34	+	5	$\frac{170}{96}$	0	+	$\frac{140}{90}$	0		Sp FT	OK	$\frac{140}{90}$	0
10	3	34	+	6	$\frac{158}{90}$	0	0	$\frac{120}{80}$	SPT		Sp FT	OK	$\frac{120}{80}$	0
11	4	25	+	$8\frac{1}{2}$	$\frac{162}{98}$	ST	+	$\frac{120}{88}$	0		Sp FT	OK	N	0
12	3	26	+	5	$\frac{152}{92}$	SPT	+	$\frac{120}{80}$	0		Sp FT	OK	$\frac{138}{100}$	0
13	3	31	+	$4\frac{1}{2}$	$\frac{170}{82}$	SPT	++	$\frac{120}{70}$	0		In FT	OK	$\frac{170}{82}$	0
14	5	24	+	$7\frac{1}{2}$	$\frac{158}{98}$	0	++	$\frac{164}{114}$	ST		Sp FT	OK	N	0
15	5	33	+	$5\frac{1}{2}$	$\frac{140}{90}$	0	+	$\frac{120}{60}$	0		Sp FT	OK	N	SPT
16	2	19	+	$3\frac{1}{2}$	$\frac{164}{94}$	0	++	$\frac{120}{80}$	0		Sp FT	OK	N	0
17	4	27	0	$6\frac{1}{2}$	$\frac{148}{88}$	0	0	$\frac{140}{98}$	0		Sp FT	OK	N	0
18	2	23	?	4	$\frac{140}{90}$	SPT	+	$\frac{124}{77}$	SPT		Sp FT	OK	N	0
19	5	27	+	8	$\frac{156}{102}$	SPT	+	$\frac{160}{102}$	SPT		Sp FT	OK	N	0
20	3	27	+	$8\frac{1}{2}$	$\frac{190}{100}$	SPT	+	$\frac{150}{90}$	SPT		Sp FT	OK	$\frac{136}{82}$	0
21	1	24	0	$7\frac{1}{2}$	$\frac{140}{96}$	T	++	$\frac{120}{80}$	HT		In $8\frac{1}{2}$	OK	N	VST
22	5	31	0	$8\frac{3}{4}$	$\frac{150}{95}$	SPT	0	$\frac{130}{80}$	SPT		Sp FT	OK	N	0
23	2	40	0	$8\frac{1}{2}$	$\frac{150}{92}$	SPT	+	$\frac{130}{90}$	T		In $8\frac{3}{4}$	OK	N	VST
24	1	21	0	$8\frac{1}{2}$	$\frac{165}{100}$	SPT	0	$\frac{150}{80}$	SPT		In FT	OK	N	VST
25	2	28	+	8	$\frac{140}{95}$	ST	0	$\frac{130}{80}$	0		Sp FT	OK	N	0
26	1	24	0	$8\frac{3}{4}$	$\frac{144}{98}$	0	+	$\frac{130}{80}$	0		Sp FT	OK	N	0

granular casts and red blood cells Her course was as follows

Date	In-take	Out-put	Blood Pressure	Albu min	Ede-ma
June 26	0	—	160/90 mm	ST	0
" 27	600 cc	800 cc	140/100 "	SPT	0
" 28	400	650 "	138/82 "	SPT	0
" 29	350	450 "	120/80 "	SPT	0

The patient was balanced on a fluid intake of 350 cc and was referred to the toxemia clinic on July 3 with a blood pressure of 120/80 mm. In the clinic, on July 10, the patient had no toxic symptoms. Her blood pressure was 148/96 mm, her urine showed a slightest possible trace of albumin and her fluid intake had averaged 300 to 350 cc daily while her output was 50 to 100 cc greater. On July 24 her blood pressure was 134/86 mm and the urine showed a slightest possible trace of albumin. On August 15 her blood pressure was 148/92 mm and the urine as before.

On August 18 the patient was admitted in active labor. The blood pressure was 140/86 mm and the urine contained a slightest possible trace of albumin. Normal delivery and puerperium ensued and she was discharged in ten days with a negative urine and a blood pressure of 110/70 mm.

This case is an example of one where the treatment was carried on over two months' time and, while complete success was not obtained, nevertheless the patient became no worse. Some may feel that this case should be classed as a low reserve kidney (if there be such a condition) but it seems as though the symptoms developed too early for that.

CASE 5 Mrs M N, Nos 694102 and 697418 white aged twenty-seven years 1 para, was first referred to the Boston City Hospital by her local physician on Dec 24 1932. Her expected date of confinement was Feb 4 1933. Her past history was irrelevant. Since the fifth month of her present pregnancy she had had slight hypertension and albuminuria. On admission she complained of headache and there was marked edema of face and extremities. Her blood pressure was 190/140 mm. The urine showed a heavy trace of albumin with granular casts and red and white blood cells. There was no fixation of gravity and the blood chemistry was within normal limits. The patient was balanced on a fluid intake of 1050 cc. Her blood pressure finally came down to 140/90 mm and her urine became albumin free. She was discharged back to her family doctor on Jan 8 1933 with instructions to follow dehydration therapy. After discharge the patient developed a cold and did not keep up her fluid balance. As a result she was referred back to the hospital on January 21 by her doctor who said that her blood pressure was 175/110 mm. On admission she progressed as follows:

Date	In take	Out put	Blood Pressure	Albu min	Ede-ma
Jan 21	0	650 cc	154/108 mm	T	++
22	500 cc	1250 "	160/100	ST	++
23	1200	1620 "	150/110	SPT	+
24	800	1700 "	138/90	ST	0
" 25	1300	1400 "	140/90	SPT	0
26	1300	1300 "	134/90	SPT	0
" 27	1150	1000 "	130/90	T	0
28	800	950 "	130/90	HT	0

In view of patient's nearness to term and increasing albuminuria labor was induced by castor oil and quinoline and by separation of the membranes. Normal labor and delivery of a six pound normal baby ensued in about six hours. The patient made

an uneventful convalescence and was discharged home in eleven days with a blood pressure of 110/60 mm and a slight trace of albumin in the urine.

This case is of interest because of its severity and the fact that she was carried through another whole month after the onset of severe symptoms without obvious damage to either mother or baby. It also demonstrates control of symptoms with dehydration return of symptoms when dehydration therapy was not carried out and at the second admission, an almost, but not quite successful recontrol.

CASE 6 Mrs M McA No 725599 white aged thirty-five years, 3 para, was first seen in the toxemia clinic of the Boston City Hospital on June 9 1933. Her expected date of confinement was Oct. 8, 1933. She had had one full term instrumental delivery and one four months miscarriage. Her progress throughout the remainder of her pregnancy was as follows:

Date	Blood Pressure	Albu min	Ede-ma
June 9	160/90 mm	T	+
July 7	156/98 "	ST	0
July 13	126/84 "	SPT	0
Aug 14	122/90 "	T	+
Aug 28	128/94 "	SPT	+
Sept 11	132/88 "	0	+
Sept 25	134/92 "	SPT	0
Oct 2	140/88 "	SPT	0
Oct 9	144/90 "	0	0

During the above months the patient was carried along with mild dehydration therapy at home. Her fluid balance was kept up with about a 1400 cc fluid intake. When she was seen on October 9, she complained of frequent headaches and, being at term, was referred into the hospital. She was dehydrated there and her blood pressure came down to 118/70 mm. She started labor spontaneously on October 15 and delivered normally a healthy infant. Her puerperium was uneventful and she was discharged in ten days with a blood pressure of 110/70 mm and a trace of albumin in the urine.

CASE 7 Mrs C A No 730975 white aged sixteen years 1 para had been seen several times in the regular outpatient clinic of the Boston City Hospital. Her last catamenia had been on March 23 1933, and her expected date of confinement was Dec. 30 1933. Her present pregnancy had been uneventful until December 4 at which time her blood pressure was found to be 168/95 mm and she showed a slight trace of albumin in the urine, with red and white blood cells and occasional granular casts. She was referred immediately into the hospital. On admission she showed slight edema of the extremities. There was an elevation of the blood nonprotein nitrogen to 40 and the uric acid to 5.7 milligrams per 100 cubic centimeters. Eye grounds showed slight edema of the retina. Her course was as follows:

Date	In take	Out put	Blood Pressure	Albu min	Ede-ma
Dec 4	0	700 cc	168/95 mm	ST	+
5	400 cc	500	140/70	ST	0
6	500	1100	140/80	HT	0
" 7	700	900	135/80	ST	0
8	700	1300	120/60	SPT	0
10	600	800	130/90	SPT	0
12	700	950	140/90	0	0
13	700	1100	150/90	ST	0
15	700	600	140/90	SPT	0
17	700	800	135/70	SPT	0
18	700	800	120/70	0	0

She was balanced on an intake of 700 cc of fluid daily and referred back to the out patient clinic. Her blood pressure and urine albumin remained within normal limits and on December 26 she was admitted in active labor and delivered. Her admission blood pressure was 130/100 mm and there was a slight trace of albumin in the urine. Sediment showed no blood cells but occasional granular casts. Ten days postpartum her urine showed no albumin but occasional granular casts and her blood pressure was 94/60 mm.

This case is interesting because although she never showed a great deal of external edema her output remained for two weeks considerably above her limited intake showing a great deal of stored fluid. In addition her normal blood pressure (94/60 mm) was low which makes the moderate elevation she had relatively greater.

### b Mild nephritic toxemias

Charts 3 and 4 represent the groups of the mild nephritic toxemias. There were twenty-six cases in each of these groups. All but two of the dehydrated group went to full term and nine in the control group terminated prematurely. There were no macerated fetuses in the dehydrated group but there were four macerated fetuses and one stillbirth in the control group. One case in the control group developed *abruptio placentae*.

#### CASE REPORTS

CASE 1 Mrs C S No 724985 white aged twenty-eight years 2 para was admitted to the Boston City Hospital on Oct. 10 1933. Her expected date of confinement was Nov. 4 1933. She had had scarlet fever in childhood. Her last pregnancy went to full term but she had had hypertension and albuminuria the last two months. The present pregnancy had been uneventful except for frequent headaches and edema of the hands and feet since the second month. She was first seen in the out patient department on July 12 at which time she had a blood pressure of 130/82 mm and a slightest possible trace of albumin in her urine. She was cared for in the regular prenatal clinic until October 9 at which time her blood pressure was found to be 154/102 mm. Her urine showed a slight trace of albumin with red and white blood cells and occasional granular casts. She showed moderate edema of the face hands and feet. She was referred into the hospital and her course there was as follows:

Date	In take	Out put	Blood Pressure	Albu min	Ede ma
Oct 10	0	1200 cc	150/100 mm	ST	+++
11	1200 cc	1100	140/75	SPT	+
12	1000	1300	125/70	—	0
13	1300	1500	110/70	0	0
14	1500	1900	115/70	0	0
15	1600	1100	110/70	—	0

On October 16 the patient was discharged back to the toxemia clinic with a blood pressure of 125/90 mm and with no albumin. While in the hospital the phthalein test was 55 per cent. Examination of eye grounds revealed numerous small areas of exudate with hemorrhage. Her fluids were balanced at an intake of about 1000 cc daily.

On October 23 the pressure was 136/90 mm and there was the slightest possible trace of albumin. On November 5 the patient was admitted to the hospital in active labor. Her blood pressure was 136/70 mm and the urine was negative for albumin. She was delivered normally of a healthy infant and had an uneventful puerperium. Her discharge blood pressure was 120/80 mm and the urine was negative.

CASE 2 Mrs N P No 725717 white aged forty-three years 5 para was referred into the Boston City Hospital from the prenatal clinic on Oct. 5 1933. The expected date of confinement was Oct. 27 1933. She had had four normal full term pregnancies and hypertension during the last five months of the last pregnancy. She had first come to the clinic on July 17 and at that time her blood pressure was 154/90 mm. This moderate hypertension had persisted and on October 4 had increased to 170/102 mm. At this time she was referred into the hospital for dehydration therapy. On admission the urine showed a slightest possible trace of albumin with occasional hyaline casts and red blood cells. The patient's eye grounds and blood chemistry were negative. Under treatment the blood pressure came down to 125/80 mm and albumin became negative. She was balanced on 700 cc daily intake and was referred back to the toxemia clinic on October 12. Four days later she came to clinic and admitted not having followed instructions. Her blood pressure had risen to 96/100 mm. She was readmitted to the hospital and labor was induced with castor oil and quinine. Her convalescence was normal and she was discharged with normal blood pressure and negative urine.

### c Severe nephritis

Charts 5 and 6 represent the dehydrated and control groups of severe nephritic toxemias. There are nineteen cases in each of these groups. Naturally our worst results were obtained in this group but even so the dehydrated cases did considerably better than those not dehydrated. Five of the cases which under dehydration were carried to full term had been induced in their previous pregnancies at periods varying from six to eight months.

#### CASE REPORTS

CASE 1 Mrs B M OPD No 307061 white aged thirty-three years 1 para was first seen in the regular prenatal clinic of the Boston City Hospital on May 22 1933. Her expected date of confinement was July 13 1933. Her past history was negative except for scarlet fever in childhood. When first seen her blood pressure was 148/94 mm and the urine was negative. On June 28 the pressure was 165/120 mm and there was a slight trace of albumin in the urine. The patient was referred to the toxemia clinic and there on July 3 the blood pressure was 190/140 mm and the urine showed a trace of albumin with red and white blood cells but no casts. The patient complained of severe headaches and moderate edema of the face and extremities. She was immediately referred into the hospital. On admission the patient was given 100 cc of 50 per cent glucose intravenously. Blood chemistry and eye grounds were negative. Her progress in the hospital follows:

CHART 4  
MILD NIPHRITIC TOXEMIAS  
Nondehydrated Group

Case	Para	Age	Prev Tox	Treatment Duration of Preg Mo	B P	Started Alb	Ede ma	Finished B P	Alb	Labor	Baby	Discharge B P	Alb
1	2	22	+	7	144	0	0	170	0	In FT	OK	N	0
					90			110					
2	5	41	++	8½	156	T	+	160	T	Sp 8¾	OK	N	?
					100			90					
3	1	23	0	8¼	145	SPT	0	130	SPT	In FT	OK	N	0
					90			80					
4	1	24	0	8	160	SPT	+	175	0	Sp FT	OK	N	0
					110			105					
5	6	27	+	8¼	170	SPT	+	130	0	Sp FT	Mac	N	?
					110			80					
6	1	26	0	7½	145	SPT	0	122	SPT	Sp 8	Mac	?	?
					110			90					
7	4	31	++	7¾	164	SPT	+	?	T	In 8	OK	?	?
					114								
8	12	39	++	7½	160	SPT	++	180	T	Sp FT	OK	N	0
					110			118					
9	1	24	0	7	138	SPT	0	170	SPT	Sp FT	OK	N	0
					90			110					
10	1	27	0	7½	144	SPT	+	160	T	Sp 8½	OK	N	0
					102			100					
11	10	41	+	6	140	0	+	128	HT	In 7¼	Mac	N	0
					100			100		Pre Sep	of Plac		
12	8	44	++	8½	140	SPT	+	144	ST	Sp FT	OK	N	0
					94			80					
13	5	36	0	8	165	0	+	150	SPT	Sp FT	OK	N	0
					100			94					
14	4	35	+	8½	140	0	++	130	SPT	Sp FT	Dead	N	0
					100			90					
15	2	25	+	8¾	140	T	+	140	T	Sp FT	OK	N	0
					95			100					
16	1	24	0	8¼	148	ST	+	150	SPT	Sp FT	OK	N	0
					80			75					
17	1	21	0	7	145	SPT	0	130	SPT	Sp FT	OK	N	0
					90			60					
18	4	32	++	8	140	0	0	150	ST	In 8½	OK	N	0
					95			105					
19	2	34	+	8½	190	ST	+	150	SPT	In 8¾	OK	N	0
					100			100					
20	1	28	0	8¾	130	ST	+	150	0	In FT	Mac	N	0
					80			100					
21	1	21	0	7½	140	T	+	135	T	In 8	OK	N	0
					100			90					
22	1	25	0	7½	138	SPT	0	130	0	Sp 8	OK	N	0
					90			90					
23	1	21	0	8	170	ST	+	145	T	In FT	OK	N	SPT
					110			95					
24	1	21	0	8¾	130	ST	+	140	ST	Sp FT	OK	N	SPT
					80			90					
25	7	38	+	8	144	0	0	180	SPT	Sp FT	OK	N	0
					86			112					
26	12	39	+	8¾	120	ST	+	155	ST	Sp FT	OK	N	0
					80			95					

CHART 6  
SEVERE NEPHRITIC TOXEMIAS  
*Nondehydrated Group*

Case	Para	Age	Prev Tox	Treatment Started				Finished		Labor	Baby	Discharge	
				Mo	B P	Alb	Ede- ma	B P	Alb			B P	Alb
1	3	34	—	7	<u>178</u> 100	ST	---	<u>180</u> 100	T	Sp 7½	Mac	<u>150</u> 90	SPT
2	9	40	+	7	<u>178</u> 110	HT	+	<u>140</u> 90	HT	In 7	OK	<u>120</u> 80	0
3	3	24	+	8	<u>175</u> 120	SPT	—	<u>190</u> 140	HT	In 8½	OK	N	0
4	11	38	+	7½	<u>222</u> 142	SPT	+-	<u>240</u> 150	HT	In 8	Mac.	Died	
5	5	35	+	6¼	<u>198</u> 100	T	+-	<u>160</u> 110	HT	In 7	Mac	<u>120</u> 80	ST
6	1	40	0	8¼	<u>160</u> 100	HT	—	<u>214</u> 110	HT	In 8½	OK	<u>130</u> 90	?
7	7	45	+	8½	<u>160</u> 100	T	—	<u>150</u> 90	HT	Sp FT	OK	<u>140</u> 90	?
8	9	37	+	7½	<u>160</u> 95	ST	+	<u>160</u> 100	?	Sp 8	Mac	<u>140</u> 80	0
9	6	28	+	7½	<u>164</u> 92	T	+-	<u>140</u> 90	T	Sp 8	OK	N	0
10	5	37	+	8¼	<u>172</u> 120	T	—	<u>160</u> 100	T	In FT	Mac	N	0
11	2	34	+	5	<u>150</u> 100	HT	+-	<u>134</u> 90	T	In 6	Mac	N	VST
12	1	31	0	7¾	<u>180</u> 110	ST	+-	<u>200</u> 110	ST	In 8	OK	N	0
13	2	32	0	6¾	<u>134</u> 100	HT	+	<u>120</u> 80	VST	In 7¼ Caes Pre Sep	Mac Plac.	N	SPT
14	8	37	+	6	<u>130</u> 90	ST	+	<u>160</u> 90	ST	In 6	Mac.	N	SPT
15	6	33	+	7½	<u>138</u> 90	T	+	<u>148</u> 104	T	In 7¾	OK	N	ST
16	7	30	—	6½	<u>134</u> 110	0	---	<u>136</u> 98	SPT	Sp 7	Mac.	N	0
17	3	38	+	3	<u>170</u> 120	0	+	<u>220</u> 140	T	In 6	Mac.	<u>162</u> 130	0
18	7	43	—	6	<u>160</u> 100	HT	++	<u>180</u> 110	HT	In 6¾	OK	<u>140</u> 100	ST
19	7	?	+++	8	<u>160</u> 100	T	—	<u>160</u> 110	ST	Sp FT	OK	N	SPT

## CHART 5

## SEVERE NEPHRITIC TOXEMIAS

*Dehydrated Group*

Case	Para	Age	Prev Tox	Dehydration Started				Finished		Labor	Baby	Discharge	
				Mo	B P	Alb	Ede- ma	B P	Alb			B P	Alb
1	1	33	0	8½	190 140	T	+++	135 95	HT	Sp FT	OK	140 100	SPT
2	2	23	+	7½	140 70	HT	0	128 80	ST	Sp 8	OK	N	0
3	3	27	+	6	160 120	T	+++	170 130	HT	Sp 6½	Mac	N	ST
4	2	22	+	2	142 84	T	+++	120 80	HT	In 8 Caes	OK	N	ST
5	5	31	+	6½	162 110	SPT	+++	130 80	SPT	In 8½	OK	140 100	SPT
6	2	29	+	6	170 110	T	+	130 80	SPT	In 7	Mac	N	0
7	2	26	+	8½	140 90	T	++	135 90	HT	In FT	OK	N	ST
8	3	28	+	6¼	152 112	0	+	166 112	T	In 8½	OK	N	SPT
9	16	36	+	7½	170 110	HT	+	170 110	HT	In 8	OK	160 110	T
10	8	31	+	6	222 128	0	+	160 110	0	Sp 8½	OK	170 110	0
11	2	22	+	8	196 98	SPT	+	170 100	0	Sp FT	OK	N	0
12	10	39	+	6	204 110	HT	+++	158 104	HT	In 6½	Mac	140 100	ST
13	6	34	+	7½	162 94	HT	++	138 90	HT	In 8½	OK	N	SPT
14	3	27	+	6	224 140	T	+++	170 130	SPT	Sp 7	Mac	160 110	0
15	10	46	+	8	155 90	HT	++	140 80	ST	Caes FT	OK	N	SPT
16	7	32	+	7½	160 100	SPT	++	135 85	0	Sp FT	OK	N	0
17	2	29	+	7	150 100	HT	+	114 74	ST	In 7½	OK	N	SPT
18	9	40	+	8¼	198 118	T	++	160 110	T	In 8½	OK	150 80	SPT
19	1	23	0	6¼	190 90	T	++	130 80	SPT	Sp 7	Mac	N	0

Just how much damage was done to this woman's kidneys by allowing her to go through this pregnancy cannot be proved, but her extreme desire for a child left no choice. At any rate an excellent opportunity was given to use dehydration over a long period of time on a case which was considered to be that of a severe chronic nephritic in spite of the lack of great hypertension.

CASE 5 Mrs A S No A5744 white aged thirty-one years 5 para was first seen in the O P D of the Newton Hospital on July 27 1933. Her blood pressure at this time was 162/100 mm and her urine showed a slightest possible trace of albumin with hyalin casts. She was referred to the hospital. On admission she gave an history of four previous full term normal deliveries with hypertension in at least the last two. She showed moderate edema of the extremities but otherwise had no toxic symptoms. Blood chemistry and renal function tests were normal. The patient was placed on dehydration therapy and fluids were balanced between 750 and 900 cc daily. She was very un-

comfortable whereas five of the control cases occurred in the preeclamptic and mild nephritic groups. No cases of eclampsia or *abruptio placentae* occurred under dehydration but two cases of *abruptio* one case of antepartum eclampsia and two of postpartum eclampsia occurred in the control group. In the cases showing albumin or persistent hypertension on discharge the control group with 15 seems definitely better than the dehydrated group with 29. This superiority is probably more apparent than real because in seven of the control group discharge findings were not recorded and it is possible that other control records were not accurately kept, especially as far as taking a discharge blood pressure or a catheterized specimen of urine was concerned.

The results of these studies make it appear

CHART 7  
SUMMARIZED STATISTICS ALL GROUPS

	Pre-eclamptic		Mild Nephritic		Severe Nephritic		All Groups	
	De-hyd	Control	De-hyd	Control	De-hyd	Control	De-hyd	Control
Total number cases	20	20	26	26	19	19	65	65
Primiparae	11	18	3	13	2	2	16	33
Multiparae	9	2	23	13	17	17	49	32
Cases carried to full term	16	12	24	17	5	3	45	32
Cases induced prematurely	3	7	2	5	8	12	13	24
B P decreased in	20	6	23	11	16	7	59	24
B P unchanged in	0	6	0	2	1	2	1	10
B P increased in	0	8	3	13	2	10	5	31
Albumin decreased in	10	2	3	7	3	3	26	12
Albumin unchanged in	9	8	12	10	6	9	27	27
Albumin increased in	1	10	6	9	5	7	12	26
Cases discharged with alb or inc b p	5	1	10	2	14	12	29	15
Number macerated fetuses	0	1	0	4	5	10	5	15
Number cases developing eclampsia	0	3	0	0	0	0	0	3
Number of cases of <i>abruptio Placentae</i>	0	0	0	1	0	1	0	2
Maternal mortality	0	0	0	0	0	1	0	1

operative and had to be watched closely to prevent extra fluid ingestion. Her blood pressure came down gradually to 130/80 mm over a period of twelve days and she was referred back to the outpatient clinic. She did not follow instruction at home and on September 14 her blood pressure had risen to 228/142 mm and her urine showed a trace of albumin. She was at this time eight and a half months pregnant and it seemed inadvisable to delay delivery further. Hence her membranes were ruptured and she had an uneventful labor delivery and convalescence. She was discharged in two weeks with a negative urine and a blood pressure of 140/110 mm.

Chart 7 represents the summarized statistics of all groups. In the dehydrated group thirteen cases had to be induced prematurely as compared with twenty-four cases (almost twice as many) in the control group. The blood pressure was decreased in 59 cases and the albumin in 26 cases of the dehydrated group as compared with 24 cases and 12 cases in the control group. Five cases of maceration of the fetus occurred under dehydration while in the control group there were fifteen cases. Furthermore all the cases of maceration in the dehydration series occurred in the severe type of neph-

ritis whereas five of the control cases occurred in the preeclamptic and mild nephritic groups. No cases of eclampsia or *abruptio placentae* occurred under dehydration but two cases of *abruptio* one case of antepartum eclampsia and two of postpartum eclampsia occurred in the control group. In the cases showing albumin or persistent hypertension on discharge the control group with 15 seems definitely better than the dehydrated group with 29. This superiority is probably more apparent than real because in seven of the control group discharge findings were not recorded and it is possible that other control records were not accurately kept, especially as far as taking a discharge blood pressure or a catheterized specimen of urine was concerned.

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Date	In take	Out put	Blood Pres sure	Al bu min	Ede ma
July 3	0	—	190/140 mm	T	++
4	700 cc	1700 cc	160/105	HT	+
5	750	900	155/105	HT	+
6	500	300	150/110	HT	0
7	300	450	150/100	—	0
9	250	750	150/94	T	0
12	500	600	145/100	HT	0
17	600	700	135/95	HT	0

The patient started up in spontaneous labor and was delivered of a normal baby by low forceps on July 17. The convalescence was uneventful and the patient was discharged home with a pressure of 140/100 mm and a slightest possible trace of albumin in the urine.

CASE 2 Mrs R G No 697743 white aged twenty three years 2 para was referred into the Boston City Hospital from the toxemia clinic on Jan 24 1933. Her past history was negative. Her last pregnancy had been terminated at eight months for toxemia. She had been followed in the toxemia clinic since August and her pregnancy had been uneventful until January at which time she began to show evidences of hypertension and albuminuria. On January 24 she had a blood pressure of 140/120 mm and a heavy trace of albumin in the urine with red and white blood cells but no casts. She was referred to the hospital. Eye grounds were negative, there was no fixation of gravity and the phthalein test was 50 per cent. She had no toxic symptoms and no edema. Under drastic dehydration therapy (averaging around 250 cc daily intake) her blood pressure came down to 110/70 mm and her urine became negative for albumin within a week. At the end of this time she started in labor spontaneously and delivered a normal baby. Although she was only eight months along by dates the baby gave no evidence of prematurity. The patient had a normal puerperium and was discharged on February 11 with a blood pressure of 110/70 mm and a negative urine.

CASE 3 Mrs E B No 725725 white aged twenty seven years 3 para was admitted to the Boston City Hospital on Oct 16, 1933. She gave a history in her last two pregnancies of two macerated fetuses occurring at seven and eight months. Her present pregnancy had been symptomless but on admission she had a blood pressure of 224/140 mm. Her blood pressure had been high on two previous occasions in the O.P.D. Her urine showed a trace of albumin with hyalin and granular casts and red and white blood cells. The blood chemistry was within normal limits. Basal metabolism was minus one. Eye grounds were negative. There was a high fixation of gravity between 1021 and 1030. The patient was placed on a dehydration régime and her fluid intake was balanced between 500 and 700 cc daily. At the end of the first week of treatment the blood pressure was 190/140 mm and there was still a trace of albumin in the urine. At the end of the second week the blood pressure varied between 150/120 mm and 170/130 mm and the albumin had decreased to a slight trace. In another week she became practically albumin free. From then until November 23 her pressure persisted around 170/120 mm and the albumin varied between none and the slightest possible trace. On November 22 the fetal heart could not be heard in spite of the fact that the patient had had no symptoms and had been albumin free for several days preceding. On November 23 the

patient went into labor spontaneously and delivered a macerated fetus. Her convalescence was uneventful and she was discharged home in two weeks with a blood pressure of 160/110 mm and a slight trace of albumin in the urine.

CASE 4 Mrs E M, No 701983 white aged twenty two years, 2 para was first seen in the toxemia clinic of the Boston City Hospital at the second month of her second pregnancy. Her first pregnancy had terminated at six months by maceration of the fetus and later separation of the placenta. Six weeks after this she had had a blood pressure of 140/95 mm and a trace of albumin in the urine. Her present expected date of confinement was Apr 27 1933. When first seen Oct 31 1932 her blood pressure was 120/78 mm and her urine showed a trace of albumin.

In November her pressure varied between 124/82 mm and 142/84 mm and her urine albumin varied between none and a slightest possible trace. In December her pressure was 134/88 mm and the albumin had increased to a trace with red and white blood cells but no casts. She had no toxic symptoms but was sent into the hospital on December 28 for dehydration therapy. Her fluid intake was balanced at about 1100 cc daily. The blood chemistry, eye grounds and gravity fixation tests were negative. The patient had a red blood cell count of 3 500 000 and a hemoglobin of 75 per cent. Her phthalein test was 40 per cent. On January 10 she was discharged back to the toxemia clinic with a blood pressure of 110/64 mm and a slightest possible trace of albumin.

During the rest of January her blood pressure varied between 138/90 mm and 150/100 mm and her urine albumin between a slight trace and a trace. Hyalin and granular casts and red blood cells appeared for the first time in her urine. The patient admitted being careless at times about her fluid intake and noticed that when she did not restrict fluids she became edematous and felt poorly. Her intake was decreased from 1100 cc to 750 cc daily. During February her blood pressure varied between 126/94 mm and 144/92 mm and her albumin from a trace to a heavy trace. She had slight edema and her output was not exceeding her intake. On March 6 the patient's blood pressure was 162/112 mm and she had a slight trace of albumin. Because of the patient's extreme desire for a child the pregnancy was allowed to continue and she was referred back to the hospital.

On admission this time her blood chemistry was again within normal limits. Her hemoglobin had dropped to 50 per cent. There was still no gravity fixation but her phthalein test had decreased to 20 per cent. During the next two weeks her blood pressure came down promptly to 120/80 mm but her albumin varied between a trace and a heavy trace. Her intake during this time had been decreased to between 200 and 400 cc daily. On March 18 the patient complained of the dehydration and was allowed more fluids. She promptly became edematous and complained of malaise dizziness and headache. On March 27 because of the persistence of a trace to heavy trace of albumin and because the patient was then one month from term and the baby seemed of fair size interruption was advised. She was delivered of a five pound healthy baby by cesarean section under spinal anesthesia. She had an uneventful convalescence and was discharged home with her baby on April 13. Her discharge blood pressure was 120/80 mm and the urine showed a trace of albumin. Six weeks later her blood pressure was 130/98 mm and the urine showed a slight trace of albumin with rare red blood cells and granular casts in the sediment.

Just how much damage was done to this woman's kidneys by allowing her to go through this pregnancy cannot be proved, but her extreme desire for a child left no choice. At any rate an excellent opportunity was given to use dehydration over a long period of time on a case which was considered to be that of a severe chronic nephritic in spite of the lack of great hypertension.

CASE 5 Mrs A S No A8744 white aged thirty-one years 5 para, was first seen in the O P D of the Newton Hospital on July 27 1933. Her blood pressure at this time was 162/100 mm. and her urine showed a slightest possible trace of albumin with hyalin casts. She was referred to the hospital. On admission she gave an history of four previous full term normal deliveries with hypertension. In at least the last two. She showed moderate edema of the extremities but otherwise had no toxic symptoms. Blood chemistry and renal function tests were normal. The patient was placed on dehydration therapy and fluids were balanced between 750 and 900 cc daily. She was very un-

comfortable whereas five of the control cases occurred in the preeclamptic and mild nephritic groups. No cases of eclampsia or *abruptio placentae* occurred under dehydration but two cases of *abruptio* one case of antepartum eclampsia and two of postpartum eclampsia occurred in the control group. In the cases showing albumin or persistent hypertension on discharge, the control group with 15 seems definitely better than the dehydrated group with 29. This superiority is probably more apparent than real because, in seven of the control group discharge findings were not recorded and it is possible that other control records were not accurately kept, especially as far as taking a discharge blood pressure or a catheterized specimen of urine was concerned.

The results of these studies make it appear

CHART 7  
SUMMARIZED STATISTICS ALL GROUPS

	Pre-clamptic		Mild Nephritic		Severe Nephritic		All Groups	
	De-hyd	Con-trol	De-hyd	Con-trol	De-hyd	Con-trol	De-hyd	Con-trol
Total number cases	20	20	26	26	19	19	65	65
Primiparae	11	13	3	13	2	2	16	33
Multiparae	9	2	23	13	17	17	49	32
Cases carried to full term	16	12	24	17	5	3	45	32
Cases induced prematurely	3	7	2	5	8	12	13	24
B P decreased in	20	6	23	11	16	7	59	24
B P unchanged in	0	6	0	2	1	2	1	10
B P increased in	0	8	3	13	2	10	5	31
Albumin decreased in	10	2	8	7	8	3	26	12
Albumin unchanged in	9	8	12	10	6	9	27	27
Albumin increased in	1	10	6	9	5	7	12	26
Cases discharged with alb or inc b p	5	1	10	2	14	12	29	15
Number macerated fetuses	0	1	0	4	5	10	5	15
Number cases developing eclampsia	0	3	0	0	0	0	0	3
Number of cases of <i>Abruptio Placentae</i>	0	0	0	1	0	1	0	2
Maternal mortality	0	0	0	0	0	1	0	1

operative and had to be watched closely to prevent extra fluid ingestion. Her blood pressure came down gradually to 130/80 mm over a period of twelve days and she was referred back to the outpatient clinic. She did not follow instruction at home and on September 14 her blood pressure had risen to 228/142 mm and her urine showed a trace of albumin. She was at this time eight and a half months pregnant and it seemed inadvisable to delay delivery further. Hence her membranes were ruptured and she had an uneventful labor delivery and convalescence. She was discharged in two weeks with a negative urine and a blood pressure of 140/110 mm.

Chart 7 represents the summarized statistics of all groups. In the dehydrated group thirteen cases had to be induced prematurely as compared with twenty-four cases (almost twice as many) in the control group. The blood pressure was decreased in 59 cases and the albumin in 26 cases of the dehydrated group as compared with 24 cases and 12 cases in the control group. Five cases of maceration of the fetus occurred under dehydration while in the control group there were fifteen cases. Further more all the cases of maceration in the dehydration series occurred in the severe type of neph-

ritis whereas five of the control cases occurred in the preeclamptic and mild nephritic groups. The series is small but the results were very satisfactory and it is hoped that similar studies will be made and reported by other obstetricians.

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## THE PROBLEM OF EYE INJURIES\*

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**T**HE first physician to care for any seriously injured eye has a real responsibility. While the same statement may be made concerning similar injuries to many other parts or organs, it is especially true of the eye because of its delicacy of structure and its importance as a functioning organ. The author will attempt to recall in this paper some of the more serious injuries and discuss their care. Illustrative cases will be used to make these points more practicable.

## NATURE OF WOUNDS AND AGENTS

In automobile accidents, although less frequent since the use of nonshatterable glass, lacerated lids are often encountered, while torn wounds may be made by blunt objects exerting considerable force—such as face trauma, when thrown against the steering wheel or instrument board. This is equally true of accidents in industry, among playing children, in certain sports and in fistie battles.

Chemical burns to the lids, conjunctiva and cornea, because of rapid infiltration and rapid necrosis are very destructive if the solutions are strong or not neutralized very quickly. Hot liquids or flames are quite similarly destructive or distort by scar contractions.

Contusions to the globe made by blunt objects which strike the eye (such as tennis- or snowballs) or against which the eye is forced (doorknobs or articles of furniture) may result in a torn iris, dislocated lens, intraocular hemorrhage and—not infrequently—torn or detached retina.

Penetrating and perforating wounds may be even more dangerous. A perforating wound is one producing a hole large enough for the escape of aqueous or vitreous humor, a penetrating wound is one piercing the globe and usually injuring deeper structures and in which there may be little or no leaking of fluids. Wounds through the cornea usually injure the iris and lens and result in a traumatic cataract, while those through the thin overlying conjunctiva and tough sclera tap the vitreous and injure the choroid and retina. In wounds over the area surrounding the cornea, the underlying ciliary body is usually cut or torn and creates a situation quite as serious as any joint wound, for this is the danger zone because of the greater

possibility of sympathetic trouble in the fellow eye.

Agents producing these wounds are of a wide variety. They may be small flying particles arising from industrial or domestic pursuits which remain within the globe or they may be larger objects such as nails, pens, sticks, sharp tools, scissors, broken glass and so forth. Injuries from arrows and B.B. shots from air guns among playing children are too frequent and the sale of these toys should be prevented by law. Explosions may carry stone, earth, and metal fragments most of which carry infection which has an immediate effect. It is, however, astonishing how many times the eye remains clean, either because the agent was sterile on entering (such as chips from a steel tool, doubtless sterilized by friction heating) or because the eye tissues are unusually resistant to ordinary pathologic organisms. The micro-organisms which are found most frequently are pneumococci, staphylococci and the streptococci. Others are found, of course, and one is usually concerned about tetanus.

Chemically contaminated agents or chemically dissolving foreign bodies add further problems. Iron and steel usually produce siderosis by dissolving, the fine particles scattering through the intraocular structures and setting up toxic inflammation. Copper acts similarly. Occasionally, foreign bodies are encysted, usually the inert ones, and may be retained with little danger.

## MANAGEMENT AND THERAPEUTICS

In all accidents a very careful history from the patient or any witness is frequently most informative and helpful. In industrial cases, early notification of the insurer is advisable. In most cases, consultation is likewise advisable—even among mature ophthalmologists—for the benefit of the patient, first, and for the support of the attending physician.

The first surgical repair of torn or lacerated lids—if carefully done with exacting tissue approximation, using fine sutures—will insure good function and, likewise, good cosmetic results in most cases. Otherwise, much difficulty lies ahead for the one who must do the necessary plastic repair.

Chemical burns should have immediate neutralization, if possible, and the application of sterile lubricants to prevent adhesions. Occasionally, early plastic operations are advisable. The cornea is particularly vulnerable and any extensive burn will doubtless result in blindness through corneal opacity or possible intraocular infection.

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Nonpenetrating wounds should have early and careful management—usually cold applications and quiet until any bleeding stops, almost always the use of atropine to keep the eye at rest, absorptive treatment to clear hemorrhage and exudates and if there is a detached retina, more quiet and continued rest in bed. If taken early many badly traumatized eyes may be restored to useful or full function but a delay of only a day or two may render the salvaging much more difficult, if not wholly impossible.

Penetrating or perforating wounds to the globe present two main problems. First the possibility of infection, secondly, the salvaging of the eye. The safest rule to follow is that of having every injured eye properly investigated no matter how trivial the injury. Many people suffer penetrating foreign bodies without being conscious of an accident.

The first care, usually given by the family or industrial physician, should be a careful cleaning with sterile saline (almost always available), the instillation of a noncorrosive antiseptic and atropine (if available) and the application of a sterile pad best held in place by adhesive. The next step is the help of an ophthalmologist who may try a hand magnet to detect a foreign body and place the patient in a hospital where x-ray detection and localization of possible foreign bodies may be made. Plans for such surgical repair or removal of foreign bodies as may be found necessary should be carried out without delay. A giant magnet is often necessary, but not all hospitals have this important apparatus. Antitetanic serum should be given and with awareness of possible serum reaction.

Penetrating wounds usually close themselves. Perforating wounds should be closed by sutures if in the sclera, or covered by conjunctival flaps if in the cornea or at the limbus. Virulent infections are usually apparent within a very short time and almost always defeat any effort at control, while moderate or delayed infections may often be controlled. Therapeutics, after the initial antitetanic serum, should consist of large doses of salicylates or foreign proteins. Boiled whole milk in 10 cc intramuscular injections, typhoid vaccines more efficiently given intravenously and diphtheria antitoxin subcutaneously are the usual foreign protein agents resorted to. These are repeated daily or at longer intervals for such periods as are necessary in a given case. Serum reactions must be watched and controlled. Atropine is almost always necessary to keep the eye at rest, intraocularly, by splinting the ciliary muscle and dilating the pupil, always with alertness for a rise of intraocular pressure.

X-ray may not be necessary in selected cases but many intraocular foreign bodies are wholly overlooked when there is no excuse for it. A few substances lodging within the eye may not

be x-ray visible. One can make no mistake in having radiographs made—it is much better to err on the safe side.

Nonmagnetable bodies, such as wood, glass, lead, stone and so forth are more difficult of removal especially if in the vitreous chamber. If small and probably clean, it is sometimes better judgment to allow them to remain, providing the eye is not too greatly traumatized and becomes quiet within a reasonable time. Larger masses of these materials usually injure so badly that enucleation becomes advisable early.

Sympathetic involvement of the other eye is possible within a few weeks or may be delayed many years—as long as forty years have been reported in authentic cases. This inflammation may show first in the irritative stage simply as tearing and photophobia or, perhaps as reduced vision if developing in the choroid in the fundus. A few eyes have been saved by heroic therapy when this serious condition has ensued but enucleation of the injured eye is usually advised. The best judgment of capable men is often taxed in such emergencies. An injured eye, from which a foreign body has been removed or in which one still resides, should always be kept under observation and the patient cautioned accordingly. During the World War relatively few cases of sympathetic ophthalmitis were encountered possibly because of early care and the use of antitetanic serum routinely. In children we meet this condition less frequently, but when it does develop, it is much more difficult to control.

#### CASE REPORTS

##### CASE 1 Torn lid

C. B. aged six while chasing a cat in his back yard September 8 1932 fell against a drain at the corner of his home and tore the lower right lid on a projecting spike. Early care was given by the family physician and the patient was sent to the hospital. The following day under general anesthesia further examination and surgical repair were carried out. A ragged tear extended from the lower punctum outward and down one inch including the skin muscle and conjunctiva. The globe fortunately was not injured.

The conjunctiva was first closed by interrupted sutures then by deep sutures the muscle was carefully brought into exact position at the inner canthus with a smooth lid margin and the skin exactly approximated by interrupted sutures. Tetanus antitoxin 800 units was given intragluteally. The eye was covered by sterile dressing.

He left the hospital on the third day and dressings were continued at the office. The wound healed by first intention.

##### End Result

In one month the lid was in good condition and had good function almost no scarring and a draining lower canaliculus.

##### CASE 2 Chemical burn

M. F. aged fifty-five while applying labels to packages for delivery from a large department store February 6 1936 splashed water glass (used for its

quick drying effect) into the left eye producing a second degree burn to the lid and conjunctiva of the lower culdesac. First aid which consisted of washing with water and instilling oil was applied by the local medical service. When seen two hours later the above mentioned burn was found but the cornea was not injured probably saved by the instantaneous involuntary closing and rotating of the eye upward.

Holocain 1 per cent in sterile ointment was used frequently and the lids kept quiet by sterile dressing. Water glass is salicylate of sodium or potassium and has an alkaline strength about equal to washing soda. Diluted vinegar would have been a good neutralizer for use by those giving first aid.

#### End Result

In eleven days the eye was white and the slit lamp showed the cornea clear.

#### CASE 3 Contusion to the globe by a snowball

R. H. aged twelve, was hit in the right eye by a playmate throwing snowballs on January 12, 1932. Home care was carried out and four days later the family physician was called because of a painful and almost blind eye.

When examined on the fifth day, the lids were swollen and closed, the eye was moderately red, there was much photophobia and lacrimation, hemorrhage obscured the iris, vision was reduced to hand motion and the fundus was not seen.

The eye was kept quiet by judicious use of atropine and periodic hot compresses and absorption was aided by dionin. As the eye cleared it was apparent that bleeding had extended into the anterior vitreous body and this was slow in clearing. No detachment of the retina had occurred at any rate none was found when the eye was clear enough to study that structure adequately with the ophthalmoscope at the end of six months. The anterior vitreous remained cloudy and was finally cleared by potassium iodide.

This case shows the folly of delayed first care and the good results to be obtained by persistent treatment.

#### End Result

In one year the eye was clear and normal vision was obtained by a correction of myopia and myopic astigmatism slightly greater in amount than required by the fellow eye.

#### CASE 4 Air rifle shot into the eye

L. L. aged eleven while playing near his home in a fine suburban residential neighborhood was shot in the right eye by another boy carrying an air rifle in March 1931 early evening. Cold applications and rest were carried out. The next morning the eye showed redness and swelling over the lower outer quadrant and a large irregular and poorly reacting pupil with vision reduced to 20/100 from 20/30 (previously recorded). No apparent lesion was discerned by the ophthalmoscope. After anesthetizing with butyn a search found a BB shot under the conjunctiva which was buried in the lower margin of the external rectus muscle. This was removed as an office procedure with some difficulty.

The eye was kept quiet with atropine and covered with a sterile pad for a few days. Within two weeks pigmentation and retinal distortion became evident just below and in front of the macula being a reaction in the choroid and retina from the trauma to the globe. Apparently the shot struck a glancing blow almost tangential to the eyeball. Otherwise at the distance of twenty feet the shot would have doubtless penetrated into the vitreous.

#### End Result

The eye rapidly became white but the retinal lesion was active for more than six months. With a correction for mixed astigmatism the vision is 20/30 and Jaeger No 1 with difficulty. Two small paracentral scotomata (blind spots) still remain as of December 28, 1933.

#### CASE 5 Perforating wound over the limbus by a large splinter of glass prolapse of iris and vitreous

M. aged eighteen months, while watching his mother working at a kitchen cabinet was injured when a package fell from a top shelf striking and breaking a conical glass orange squeezer, a splinter from which apparently fell into his right eye. The family physician gave ether and made sufficient examination to determine that a sizable hole had been cut into the globe. After telephone consultation mercurochrome and atropine were instilled a sterile pad was applied and the child was sent to the hospital. After reexamination of the eye was made tetanus antitoxin (1000 units) was given intramuscularly and plans made for operation the next day.

January 21, 1936 again under anesthesia more careful examination was possible and an irregular hole 4 mm in greatest width and filled with prolapsed iris and vitreous was found over the limbus at seven o'clock. It was clinically clean. The lens was clear (?) and in normal position. The fundus was not studied with an ophthalmoscope. No fragments of glass were found then or by the family physician the previous evening. Presumably one rather large splinter had—largely by its weight—produced the perforation. The prolapsed iris and extruding vitreous were excised and a very large conjunctival flap was brought from below and sutured above the cornea entirely covering the hole as well as the cornea. Although the eye was still clinically clean, a very guarded prognosis was given for saving the injured eye for safety to the fellow eye (because of the ciliary body injury) or for useful vision.

At the second dressing on the sixth day the conjunctiva had returned to its original position except for covering the perforation and extending over the cornea about 3 mm at that point. The eye was left open after the twelfth day being white and clean with a good fundic reflex and apparently good vision.

#### End Result

On March 16, 1936 the eye was white and clean. The lens showed cataractous change in the region of perforation.

#### CASE 6 Multiple extensive lacerations of the eyeball and lids by glass from a broken eye glass

Mrs. A. aged fifty while playing golf July 21, 1932 suffered a severe injury to her right eye when struck by a ball hit by a masher at forty yards. After care by her physician both for the eye and the shock incident to the severe blow she was seen the next morning at the office. Multiple lacerations to both lids by glass and crushing against the bony orbital margins by the driven ball and a deep cut traversing the whole cornea through which vitreous and torn iris tissue extruded were found. There was no vision. Fragments of glass were removed, lid wounds adjusted and the patient was sent directly to the hospital for antitetanic serum and enucleation. The eye was too badly lacerated and crushed to attempt to save it.

#### End Result

After consultation exsiccation was done on the second day buttonholing the posterior sclera and

removing 4 mm of the optic nerve. The remaining scleral rim with attached muscles made a better stump than implanting a glass ball in the presence of so much trauma. Deafness in one ear and general nervous instability retarded convalescence. A well fitting and well matched prosthesis is appreciatively worn by the patient.

#### CASE 7 Retained foreign body within the vitreous

A plumber aged twenty-two while trying to remove the cap from a trap under a dirty sink with a cold chisel and hammer was struck by some thing in his left eye February 19 1934. No glasses were worn. Immediate care was given by the local physician called by his employer and within two hours he was seen at the hospital. Observation showed a slight injury about the middle of the upper left lid on the margin a penetrating wound of the cornea near the limbus at eleven o'clock a slight tear in the pupillary margin of the iris and a hazy line through the upper third of the lens as if a foreign body had traveled from above downward toward the lower anterior vitreous body. The haziness of the lens within two hours after injury illustrates the effect and rapidity of trauma to this delicate structure. A test by hand magnet gave no response. Localization by x-ray showed a foreign body  $3\frac{1}{2}$  mm  $\times$   $1\frac{1}{4}$  mm lodged in the lower anterior vitreous chamber. The body of the trap being cast iron and the top (upon which he was chipping) being brass the foreign body from this source would not be magnetable.

He returned home to make plans to enter the hospital for care. Antitetanic serum was given. On the third day under local anesthesia a giant magnet was tried. After several tries a bright metallic foreign body was brought around the lens below and dropped on the iris below the pupillary border. The patient was placed upon a table and under the usual aseptic technique for intraocular operations a keratome incision was made under a conjunctival flap at six o'clock and the foreign body was removed by hand magnet. This chip of magnetable steel came from the hammer or cold chisel and was probably sterile by heat when entering the eye.

He left the hospital on the twelfth day and was told to use homatropine 2 per cent twice daily following a control of hypertension caused by the rapid swelling of the traumatic cataract. April 17 a needling of the anterior capsule was done to permit absorption of the soft lens mass through the aqueous. The lens was absorbed by September and a needling of the posterior capsule was made to improve vision.

*Had he worn glasses or protective goggles at his work the foreign body would never have reached his eye.*

#### End Result

At the end of nine months a correcting lens gave normal vision at both distance and near but he could not wear the strong lens necessary to accomplish this after the cataract was absorbed because of confusion to his normal right eye. The eye had begun to turn outward from disuse. The vision however even without any glass was helpful to him—the peripheral vision detecting automobiles and other moving objects approaching from the left.

#### CASE 8 Penetrating foreign body through the cornea lodging in the lens traumatic cataract

T. Laster in a shoe factory aged thirty-four slowly became aware of lacrimation of the left eye and dimness of vision. Seen first March 5 1932 when vision was reduced to hand motion at three feet because of hazy lens in which could be seen a small chip of metal. There was a small scar in

the cornea through which the chip had entered. He was unaware of any eye injury but on careful questioning recalled that about two weeks previously he had to wipe tears from his eye one day while at his machine in the operation of which small metal staples were used. He had made no report to his foreman and there developed great difficulty in the acceptance of liability by the industrial insurer. The clinical history could develop no other incident to explain the circumstances.

On October 2 the slit lamp showed a reduction in the size of the foreign body and rusty pigment diffused through the soft lens substance (siderosis). One month later a cataract operation was done removing the residual of the foreign body with it.

#### End Result

Three weeks later he obtained 20/30 and Jaeger No 1 vision with strong correcting lenses but could not wear this correction without confusion to his other nearly normal eye. A glass was prescribed with instruction to wear it for protection against a similar injury in the future.

#### CASE 9 Penetrating wire wound through lower lid into the vitreous chamber endophthalmitis

M. Huffing wheel maker aged thirty-four was struck in the left eye August 26 1935 by a wild wire in the process of winding a huffing wheel. Immediate care was given by the factory physician. Three days later the eye was found to be red with the pupil slightly dilated by atropine iris muddy hypopyon in the lower aqueous chamber and vision reduced to hand motion at three feet. A wisp of vitreous extruded from an invisible (?) wound in the lower sclera. The fundus structures were not seen because of extensive exudate over the lens and haziness of the vitreous.

He was hospitalized but was not given antitetanic serum because he had had 1500 units of this given three weeks previously for a cervical wound and had showed a serum reaction. A blood count showed 12 800 white cells with 78 per cent neutrophils. The Wassermann was negative.

Atropine frequently instilled would not keep the pupil open and suprarenin bitartrate was added twice daily always widely dilating for a time. Sodium salicylates in 15 grain doses were given four times a day.

On September 11 Dr. Hugo Riemer was asked to see him for the insurance company and considered enucleation for safety to the good right eye but first advised foreign protein in the form of diphtheria antitoxin daily for one week. Consulting with Dr. Sanford Hooker immunologist of the Evans Memorial Hospital the following procedure was carried out. After a negative intracutaneous test for sensitivity diphtheria antitoxin was given. First 15 cc then 3 cc and then 5 cc daily until eight doses were given. After the eighth dose a mild urticarial reaction was manifest and controlled by 5 cc of adrenalin. The following dose was reduced to 3 cc.

He left the hospital on the twenty-sixth day after injury with an almost white eye and a few iris adhesions. He continued treatment as an ambulant and was instructed to return to work on November 21 having vision of 8/200 because of organized exudate over the anterior lens capsule from the excessive plastic iritis and some anterior vitreous opacities.

#### End Result

February 12 1936 vision was 20/200 the eye white. Glasses were given for a slight refractive error in the good right eye and for protection. The eye will be kept under observation for possible

flare ups before final insurance settlements are made

CASE 10 Penetrating corneal wound by wire (purulent) panophthalmitis

Mrs F aged sixty four, while shaking a rug through an open window September 21, 1929 was struck in the right eye by 'something' Five hours later her physician removed a half inch of rusty screen wire projecting from the cornea When seen two days later, the lids were red and swollen the eyeball was red with marked conjunctival chemosis and the anterior chamber was filled with pus There was much pain The patient refused operation either enucleation or incision for drainage, consequently she was made as comfortable as possible with hot compresses, antiseptics, and so forth

#### End Result

Phthisis bulbi (shrunken globe), no vision Left eye is normal with glasses

#### SUMMARY AND CONCLUSIONS

When one is confronted with an eye injury, the following points should be borne in mind

- 1 Immediate or early care, regardless of the extent of injury, is always advisable
- 2 Careful and early surgical repair of torn lids will insure best function and fewer scars
- 3 X-ray to complete a diagnosis and a giant magnet to remove deep foreign bodies are essential equipment in many cases
- 4 Infection is usually apparent early and is introduced, with few exceptions, at the instant of penetrating wounds
- 5 Consultation with an eye surgeon or among eye surgeons is sound practice
- 6 Careful watching and efficient therapeutics are imperative if the injured eye is to be saved and sympathetic involvement of the fellow eye prevented or controlled

#### REFERENCES

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#### RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR JUNE 1936

Disease	June 1936	June 1935	5 Yr Average*
Anterior Poliomyelitis	6†	5	6
Chickenpox	893	1051	1052
Diphtheria	20	34	99
Dog Bite	1334	1327	986
Epidemic Cerebrospinal Meningitis	15	2	5
German Measles	684	5898	1298
Gonorrhea	406	526	591
Lobar Pneumonia	341	272	222
Measles	4066	1486	2704
Mumps	1232	406	597
Scarlet Fever	725	742	957
Syphilis	423	418	411
Tuberculosis Pulmonary	259	312	342
Tuberculosis Other Forms	52	26	41
Typhoid Fever	12	6	10
Undulant Fever	1	3	2
Whooping Cough	390	361	646

\*Based on figures for preceding five years  
†Nonparalytic cases

#### RARE DISEASES

*Actinomyces* was reported from Marblehead 1  
*Anterior poliomyelitis* (nonparalytic) was reported from Cambridge 1 North Andover, 1 Southborough 3 Worcester 1 total 6  
*Anthrax* was reported from Peabody, 1  
*Diphtheria* was reported from Boston 8 Cambridge 1, Canton 1 Chelsea 1, Fall River 1 Lowell 1 Medford 1 Newbury 1, Salem, 1 Somerset 1 Stoneham, 1 Taunton 1 Worcester, 1 total 20

*Dysentery, bacillary* was reported from Attleboro, 8  
*Encephalitis lethargica* was reported from Lowell, 1 Milton, 1, total, 2  
*Epidemic cerebrospinal meningitis* was reported from Arlington, 1 Boston, 6 Brockton, 1 Deerfield 1 Everett, 1 Fall River, 1, Fitchburg, 1, Lynn 1, Worcester, 2 total 15  
*Malaria* was reported from Winchester, 1  
*Septic sore throat* was reported from Barnstable 1 Belmont, 1, Boston, 7, Braintree, 1 Gardner, 1 Haverhill, 1 Lynn, 1, Petersham, 3, total, 16  
*Tetanus* was reported from Brookline, 1 Lee, 1 Saugus 1, Worcester, 2 total, 5  
*Trachoma* was reported from Boston, 3 Brookline, 1 Chelsea, 1 total, 5  
*Trichinosis* was reported from Boston, 1  
*Undulant fever* was reported from Pittsfield, 1

Diphtheria had its lowest reported June incidence with less cases reported for the month than might have been expected in one day in 1923

The reported incidence of anterior poliomyelitis was not remarkable

Epidemic cerebrospinal meningitis was reported to a higher level than any time since 1930

A focus of canine rabies has developed in Shrewsbury and neighboring communities with eight positive heads reported through July 23

The reported incidence of lobar pneumonia and mumps was higher than for any other June on record

Measles typhoid fever, and tuberculosis other forms were reported above the five year average

The incidence of scarlet fever whooping cough German measles and chickenpox was not remarkable



## CASE RECORDS of the MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED  
IN WEEKLY CLINICAL PATHOLOGIC EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

### CASE 22331

#### PRESENTATION OF CASE

*First Admission* A thirty-three year old Canadian businessman was first seen complaining of dyspnea and swelling of the abdomen.

The patient had always been well and active until fifteen months before he was first seen at which time he had an attack of "grippe" associated with some corvza. About a week later he had some substernal oppression and fever and a few days later a pericardial friction rub was heard. After three days a pericardial tap was done and 20 cubic centimeters of bloody fluid was removed. Subsequently he developed dyspnea and a paroxysmal cough which were relieved at intervals during the year preceding his entry by left thoracic paracentesis. Such taps produced as much as 2,000 cubic centimeters of clear straw-colored fluid which was negative for tubercle bacilli both by direct examination and guinea pig inoculation. He remained in bed for eight months, up to five months before admission at which time he was allowed up and did well for a few weeks. During the first four months while in bed he had some fever. Three months before entry his abdomen began to swell and he again became dyspneic. Two abdominal taps during the ten days before he was first seen revealed large quantities of clear yellowish fluid. A month before coming to the hospital he developed gradually increasing edema of the lower extremities, trunk, neck, and face. This was associated with a varying degree of cyanosis. Throughout his illness he had a low pulse pressure and a paradoxical pulse. Another pericardial tap ten days before entry produced bloody fluid. There was little precordial pain after the first few weeks of his illness and the cough had completely subsided. He was known to have had a large liver for about one year and there was said to be a constant albuminuria. His treatment had consisted of limited activity, fluid restriction, a grain of digitalis daily and some silvergan all of which were said to be effective to a certain extent.

The patient had had diphtheria in childhood, a tonsillectomy at the age of nineteen and a left sided dry pleurisy three years ago.

Physical examination showed a fairly well-developed and nourished slightly cyanotic young man who appeared to be moderately ill. The eyes showed slight exophthalmos but were otherwise negative. There was faint reddening of the throat and the cervical veins were distinctly engorged. Breathing was not labored. The apex impulse of the heart was weak but was seen and felt in the fifth interspace 10 centimeters to the left of the midsternal line. The sounds were regular and of fair quality. The second pulmonic sound was split and there was a slight to moderate paradoxical character to the pulse. A faint mid-systolic murmur was heard at the apex and left side of the xiphoid in both recumbent and erect positions. Some evidence of fluid was elicited in the left chest but the remainder of the examination of the lungs was negative. The blood pressure was 110/85 although a month previously it had been 90/80. The liver was enlarged to 9 centimeters beneath the costal margin and there was some evidence of ascites. There was edema of the lower extremities and the sacrum.

The temperature was 98° the pulse 110. The respirations were 28.

Examination of the urine showed a specific gravity of 1.020 with a trace of albumin. The sediment contained an occasional red blood cell, white blood cell and granular cast. The blood showed a red cell count of 5,900,000, with a hemoglobin of 100 per cent. The white cell count was 15,300. 83 per cent polymorphonuclears. The nonprotein nitrogen of the blood was 40 milligrams. An electrocardiogram showed normal rhythm with low amplitude of Q-R-S and T waves in all four leads. ST<sub>2</sub> and ST<sub>3</sub> were sagging in character. A venous pressure determination was 24 centimeters of water.

X-ray examination showed dullness of the left side of the chest except for a small area in the costophrenic angle. The diaphragm on this side appeared to be low but the heart and mediastinal contents were not displaced. In the upper portion of the opaque shadow there was an irregular mottling and on the right side there was a bulge to the right in the region of the left auricle. The right lung field was clear.

On the second hospital day a pneumothorax pocket in the left chest was tapped and 275 cubic centimeters of air was removed. The paradoxical pulse became less evident and the patient's color improved. On the same day a pericardial tap was performed and 415 cubic centimeters of bloody fluid was removed. In inserting the needle a tough parietal pericardium was encountered. No organisms were found in a direct smear of the fluid. The patient responded with considerable improvement to these measures and his pulse gradually diminished to 80 the venous pressure fell but the blood pressure and pulse pressure did not change.

remarkably. His temperature, however, fluctuated between 99° and 101°. On the eighth hospital day another x-ray showed that the area of pneumothorax had disappeared and the entire left lung field was dull throughout. The heart and mediastinal contents were not displaced and the bulge to the right was smaller than when previously noted. A week later 2090 cubic centimeters of turbid greenish yellow fluid was removed by abdominal paracentesis. The patient was discharged on the following day, to remain under observation at a local hotel.

#### *Final Admission, six weeks later*

Five days after his discharge about 90 cubic centimeters of clear yellow fluid was removed from his left pleural cavity. Diuretics were administered with excellent results. The patient continued to run a low grade fever and on the fifteenth day after discharge examination showed that the puffiness of his face was considerably less. The veins of the neck and arms were again engorged and the venous pressure was higher (about twice the normal). The heart sounds were somewhat distant but their quality was fundamentally unchanged. There were frequent extrasystoles. The pulse was paradoxical and the blood pressure 90/65. The entire precordial area and left lower thorax was dull to percussion as was the left back up to the angle of the scapula. There was diminution in the amount of ascites. Subsequently his temperature gradually showed an afternoon rise to 102° and occasionally to 103°. Several pericardial taps were done and decreasing amounts of bloody fluid obtained. The patient now obtained less relief from these taps and diuretics likewise produced less effect. He developed a dry, annoying cough and occasionally had a sharp shooting pain in the region of his heart. Physical signs were relatively unchanged except that a sharp clicking sound heard well with the unaided ear was elicited over the precordium during systole. Pericardial tap now showed chocolate colored fluid with considerable pus and fibrin. No tubercle bacilli were present on direct smear. For about one week before admission the patient began to have brief periods of confusion and became evidently weaker.

He gradually became stuporous and on the day of the second admission his temperature rose to 105° and the spleen became palpable. He became comatose and died four days later, two months after his first entry to the hospital. An x-ray examination shortly before his death showed no changes in the left chest. There was, however, a diffuse mottling throughout the entire right lung.

#### DIFFERENTIAL DIAGNOSIS

DR GERALD BLAKE. We are dealing here with a man of thirty-three whose past history

makes him a possible candidate for rheumatic heart disease and a more probable candidate for tuberculosis. He is said to have had gripe at the onset of his illness and gripe has come to mean any upper respiratory or sinus or respiratory infection or even the start of any disease that causes malaise with some fever. It originally was synonymous with influenza and the significance here might be that influenza tended to light up quiescent tuberculous processes. This man had a pericardial effusion that was bloody in character and while occasionally such fluid may be found in severe nontuberculous or uremic conditions we at once think of the probability of malignant disease—including lymphoblastoma—and of tuberculosis as the most likely causes. His other symptoms and signs seem to be dependent upon the presence of adhesions or constant fluid or both in the pericardium and we have evidence that both were present most of the time. A striking thing in his case is the presence of fluid in the left chest without fluid in the right chest as is more commonly seen in failure of the heart from whatever cause. Since we do not know whether this was an exudate or transudate it may be a result of his previous pleurisy rather than a result of the incompetence of his heart. The negative guinea pig test of the fluid is against this. Enlargement of his liver and ascites is best explained on the known pericardial condition and the presence of constant albuminuria can be due to chronic passive congestion with or without some element of nephritis. The recent development of edema of the extremities, together with edema of the trunk, neck and face, may be the result of increasing interference with the venous return to the heart or possibly to more marked kidney involvement. My comment on his treatment would be that with such signs of failure and fluid he could have had more complete rest, larger doses of digitalis and more salivarian.

The enlargement of the cervical veins found on physical examination again points to interference with the venous return either from congestive failure or from pericardial adhesions around the veins or from the pressure of a mediastinitis due to whatever caused the pericarditis. His slight degree of exophthalmos might have been due to this—or natural. I can find no other cause for it. This degree of obstruction was not sufficient, apparently, to cause labored breathing. The apex impulse shows the heart not to be much if any enlarged to the left and the sounds do not suggest the presence of endocarditis. The split second pulmonic sound is not significant in the presence of pericardial pressure and we should expect a paradoxical character to the pulse. I would interpret the faint midsystolic murmurs in the mitral region as an evidence of some

relative mitral regurgitation or possibly a pericardial or pleuropericardial rub. The absence of fluid in the right chest is difficult to explain. Certainly the presence of true congestive failure as a result of the pericarditis is practically ruled out by this finding, and it signifies the absence of pressure on the azygos vein on that side as well as the absence of constriction around the right pulmonary veins on entering the pericardium. The blood pressure readings were what we would expect in the presence of pericardial effusion and the edema of the legs due to the circulatory failure and the ascites. At entrance he had no fever.

Laboratory work shows a urine which concentrates well and with its sediment findings is consistent with a considerable degree of chronic passive congestion. The findings are against true nephritis except that the nonprotein nitrogen is slightly elevated. One may expect a secondary polycythemia of this degree with retarding fluid in the left chest and pericardium. The white count of 15 000 83 per cent polymorphonuclears, signifies some degree of inflammatory process, but does not help us in the diagnosis. The electrocardiogram is consistent with pericardial effusion and nothing else and the increase in venous pressure is due to either failure or interference with the venous return to the heart.

The first x-ray shows fluid pretty well throughout the left chest which does not displace the heart or mediastinum, either because of the thinness of the layer of fluid or because the mediastinal contents and heart are fixed in position by an inflammatory or malignant process. The clear area in the costophrenic angle may be due to encapsulation of the fluid above it or the presence of a little pneumothorax held at this point by encapsulation above it. The low diaphragm is in favor of this last. The irregular mottling in the upper part of the opaque shadow sounds like either metastasis or tuberculosis. If the bulge to the right is the left auricle we must consider a mitral stenosis which we have no evidence for or assume that the bulge is due to a gland or other malignant tuberculous manifestation.

The tapping of a small pneumothorax pocket on the second day improved the patient's color and pulse again suggesting that pressure was relieved from a fixed heart and mediastinal contents. The toughness of the parietal pericardium is consistent with either of the two types of pericardial involvement we are considering malignant disease or tuberculosis and is also consistent with Pick's disease in which however we would not expect to find bloody fluid. Increase in temperature may be due to infection of the fluid somewhere or to the increase of an inflammatory or malignant process. With the whole left chest dull and no

displacement of the heart the evidence is of fixed heart and mediastinal contents or little fluid or a diffuse process in the lung itself. The abdominal fluid at this time is infected from the disease process with mixed infections or possibly from repeated taps.

At his last admission his chest fluid was still uninfected although he had increase in temperature with an afternoon rise consistent with tuberculosis. There is now less space in the pericardial cavity and less relief from pericardial taps. His cough is nonproductive and the result of pleural or mediastinal irritation. I would interpret the clicking sound as due to a pericardial or pleuropericardial adhesion. The chocolate color of the last pericardial tap should be due to a combination of blood and pus. And I believe he died from septicemia superimposed on a tuberculous or malignant pericarditis which at the last became completely adherent—tuberculosis of the lungs or metastasis to both lungs, cirrhosis of the liver with perihepatitis or perisplenitis, and chronic passive congestion of the kidneys.

I will have to wait until we see the last x-ray before making the diagnosis between these two conditions from the appearance of mottling throughout the entire right lung.

At present my first choice is tuberculosis starting in the left pleural cavity, my second, malignancy starting in the left lung.

DR AUBREY O HAMPTON. This is the first chest film. It was taken at a relatively close distance with the patient apparently on his back. The right side of the diaphragm and the right lung are perfectly normal. The left side shows the homogeneous dullness described and the increase of radiance at the base. Since we know he had a pneumothorax and was lying on his back I think this shadow is an air bubble in the pleural cavity. It is not very characteristic of pneumothorax but I think this may be due to the position the patient was in when the film was taken. The shadow described as bulging toward the right above the usual position of the right auricle certainly simulates left auricle seen to the right of the spine its lower portion, not its upper portion. Here it is much too high and is very prominent. We find very few left auricles that are so prominent even in advanced mitral stenosis. I doubt if we should have called this left auricle. It is a queer shadow. I do not know just what to make of it.

Here is the film taken seven days later. It looks a little more like the left auricle. It is not quite so prominent.

DR ROBERT E GLENDY. Four hundred cubic centimeters of bloody fluid had been removed from the pericardium before that film was taken.

DR HAMPTON. That would explain the reduction of size in the shadow and you can then say there was probably an adhesion to the peri-

cardium at this point with sacculation. The air in the pleural cavity has not disappeared. The quantity of fluid on the left side has increased. The right lung is still clear.

In this film taken two months later we still have a little air in the left pleural space, and the right diaphragm is less distinct than normal. The right border of the heart is not more brilliant than before and we have these fine miliary-like diffuse changes in the right lung which look like early miliary tuberculosis. I do not see any reason to change the diagnosis from that.

DR GLENDY: I just want to mention a few of the salient points in this case. One of the most striking things, at least from the diagnostic point of view, is the fact that he was so much improved clinically by the removal of fairly large amounts of fluid from the pericardium, without any remarkable change in the blood pressure or pulse pressure. The cyanosis diminished, the venous pressure went down, his appetite improved, and the cough that he had disappeared. It was very striking and yet there was practically no change in his blood pressure, indicating that there was probably a constrictive process preventing adequate cardiac filling as well as cardiac tamponade from the pericardial effusion.

In regard to diuretics, I think he probably had too much salyrgan. He had been given frequent injections from which he sometimes got quite marked reactions, mainly chilly sensations and a rise in temperature. I had never seen a case in which salyrgan produced a reaction until one case preceding this, also in a patient with constrictive pericarditis.

In regard to etiology, in the cases of constrictive pericarditis that Drs. White and Churchill have reported, those with tuberculous pericarditis have done very poorly, and two who came to operation either died on the operating table or shortly thereafter. This case did not come to operation, but was under observation with that possibility in mind. In regard to the etiology of pericarditis in general, the textbooks report that perhaps tuberculous pericarditis is next in frequency to rheumatic pericarditis, but it certainly must be questionable as to whether or not many cases of uremic pericarditis are overlooked clinically. There are three forms of tuberculous pericarditis, first, that which is part of a general miliary process, the second, the diffuse form where all the serous membranes are involved to a greater or lesser extent, and the third, a dry insidious process in which adhesions usually form. I think perhaps this case is a combination of the polyserous and the adhesive types, miliary tuberculosis developing as a terminal event. Some of the largest pericardial effusions on record are the result of tuberculous pericarditis. There is considerable

doubt as to whether tuberculous pericarditis can occur as a primary focus, probably not. It is remarkable, I think, that it rarely ever arises as a complication of pulmonary tuberculosis. The left pleural space of the mediastinal lymph glands must have been the primary focus here.

We did not find digitalis very useful in this case. Tapping the pericardium or the chest improved him much more than using any drug. The exophthalmos I think was partly natural and partly due to congestion. He also had considerable edema of the conjunctivae. The precordial murmur, I believe, was pericardial in origin. The absence of fluid in the right chest is difficult to explain, sometimes it is there and sometimes it is not, and occasionally it may come and go alternately on the two sides. The blood pressure readings I have already discussed. The urinary findings were probably due to congestion more than anything else.

DR DONALD KING: I saw this patient the day before he died. There was one helpful point in the history that was not given: Dr. Blake. One of the early taps did show tubercle bacilli, so we had that to go on. At that time he was said to have shown a picture of generalized tuberculosis.

DR GLENDY: The original effusion showed tubercle bacilli in the smear but no organisms were found in smears from any of the numerous taps done here. However, the guinea pig inoculations which were reported subsequent to his death were positive.

DR KING: With his high fever and large spleen and this x-ray picture consistent with miliary tuberculosis, it seemed that he had a generalized tuberculosis from which he was dying.

#### CLINICAL DIAGNOSES

Pericarditis, tuberculous  
Miliary tuberculosis

#### DR GERALD BLAKE'S DIAGNOSES

Pericarditis, tuberculous  
Miliary tuberculosis

#### ANATOMIC DIAGNOSES

Pericarditis, tuberculous  
Miliary tuberculosis, generalized, involving the lungs, spleen, kidneys and adrenals  
Pneumonitis, localized  
Perihepatitis, localized  
Emaciation, moderate  
Cirrhosis, ? cardiac  
Pleuritis, left, chronic fibrous

#### PATHOLOGIC DISCUSSION

DR TRACY B. MALLORY: I do not think we concealed from Dr. Blake any information actually obtained in this hospital. The origi-

nal tap was done in Ohio and was said to have shown tubercle bacilli

Our experience with tuberculous pericarditis is that it is often quite difficult to prove and we almost invariably are forced to resort to guinea pig inoculation to do it. At the autopsy table all anatomical evidence of tuberculosis may be lacking, even microscopic tubercles impossible to find, and only the guinea pig can be counted upon to prove the case.

He had a very extensive pericarditis with marked thickening of the pericardial walls in places eight millimeters thick. There was still a great deal of shaggy fibrinous, quite gelatinous exudate. The fluid in the various semi-encapsulated cavities that were present was clear and showed no evidence of hemorrhage.

DR MALLORY: The cause of death was a very widespread miliary tuberculosis in every organ of the body. The greatest surprise at the autopsy was that both adrenals were almost completely destroyed and he must have been very near to the appearance of Addison's disease. I personally do not find the lack of pleural fluid in the right chest so remarkable as the clinicians seem to think. In a chest obliterated by adhesions as in this case you cannot have a large pleural effusion. The left pleura was only partially adherent and in the unobliterated spaces he had several independent collections of fluid.

DR BLAKE: Can you explain the round shadow in the heart findings? It suggests distortion of the pericardium.

DR MALLORY: I think it is that. The only other thing we found that could have produced a round shadow was a very large, old bronchial lymph node but that would have been higher.

DR KING: Would you suspect that the right pleural cavity was obliterated?

DR HAMPTON: No, I was surprised to hear Dr Mallory say that the right diaphragm was perfectly smooth. Usually you can see thickened pleura.

## CASE 22332

### PRESENTATION OF CASE

A seventy year old white woman was admitted complaining of increasing constipation.

About two and a half months before entry the patient noted a sudden change in her bowel habits. Previously she had had regular daily movements without the use of cathartics but at this time movements required considerable straining and occasionally she had no stool for two days. She began to take laxatives at irregular intervals and about two weeks before coming to the hospital the stools became darker in color although no blood was recognized. She recalled that about six or seven months before

coming to the hospital the stools were narrow and pencil-like in appearance but subsequently they became quite copious and remained so until the onset of her current illness when they became extremely scanty except for an occasional large normal appearing movement. There was no pain until three days prior to entry, at which time a few "gas pains" occurred. There were no bowel movements for four days and enemas brought no return. The abdomen gradually became distended and she became slightly nauseated but did not vomit.

Physical examination showed a very thin, pale, elderly woman in no acute discomfort. The lungs were clear and the heart normal. The blood pressure was 130/80. The abdomen was markedly distended and tympanitic and there was slight edema of the abdominal wall. Peristalsis was not visualized but high pitched tinkling sounds could be heard with the stethoscope. No evidence of ascites was demonstrated. The temperature was 98°, the pulse 100. The respirations were 20.

Examination of the urine showed a slight trace of albumin and a brown precipitate with the Benedict test. Large amounts of acetone were present. The sediment was negative. The blood showed a red cell count of 3,900,000 with a hemoglobin of 70 per cent. The white cell count was 20,300, 88 per cent polymorphonuclears. A stool specimen gave a positive reaction to the guaiac test. The nonprotein nitrogen of the blood was 40 milligrams. The serum chlorides were 94 cubic centimeters and the serum protein 4.3 grams. A Hinton test was negative.

A plain film of the abdomen showed a large quantity of gas in the colon and ileum. Gas in the colon extended down to the sigmoid and the cecum and terminal ileum were markedly dilated.

On the second hospital day a cecostomy was done. The patient felt quite shaky postoperatively and had a fever up to 101° for four days. Thereafter she improved considerably.

Two weeks later a barium enema ballooned the rectum and sigmoid and met a definite obstruction in the region of the junction of the descending colon and sigmoid. Barium could not be forced beyond this point. An irregular soft tissue tumor about the size of an orange was seen in this area. There was an area of calcification 2 by 1 centimeter in the left side of the true pelvis medial to the soft tissue tumor.

A week later another laparotomy was performed.

### DIFFERENTIAL DIAGNOSIS

DR HENRY H. Faxon: This is a story of subacute obstruction of the large bowel finally becoming complete in a diabetic woman.

of seventy. The chief problem in differential diagnosis is whether the primary lesion was within the lumen of the bowel or whether the obstruction was caused by extrinsic pressure. The woman's age together with the lowered red count and hemoglobin make cancer as the fundamental lesion the most likely possibility.

In favor of cancer at the rectosigmoid junction are the law of probability, the characteristic story of increasing large bowel obstruction, and the finding of a positive guaiac in the stool on the only examination quoted. However there are certain definite objections to this diagnosis which make me exclude it as my first choice.

In the first place the history tells us that there was a "sudden" change in her bowel habit only two and a half months before entry. With carcinoma of the large bowel that had gone on to complete obstruction an antecedent history dating back a longer time would be more characteristic. If we evaluate the story further it may be that a longer period of difficulty was actually present, for below the original statement comes the remark that "about six or seven months before coming to the hospital the stools were narrow and pencil-like in appearance but subsequently became quite copious and remained so until the onset of her current illness, when they became extremely scanty except for an occasional large normal appearing movement." If her obstruction were due to a lesion arising in the large bowel it seems improbable to me that she would have experienced such freedom from symptoms between the time mentioned seven months before and the later date of two and a half months prior to entry which she gives for the onset of her trouble. It is not inconsistent with an obstructing lesion of the colon to have "copious" movements for if the pathology is high enough in the colon the rectum can accumulate a good deal of feces below the obstruction before the person is actually called upon to defecate. The absence of tenesmus in this case is clinical evidence that the lesion was not low which is later confirmed by x-ray.

The second point which seems unusual for a lesion primary in the large bowel is the relative absence of blood in the stools. It is true that some blood was present because the guaiac was positive and the patient noted that the stools had become somewhat darker. But this observation had been made only two weeks before coming to the hospital. The patient had never recognized any blood in the stools and the degree of anemia was not severe.

In the third place there is a note that not only was the abdomen distended and tympanitic but also that there was "slight edema of the abdominal wall" at the time of complete ob-

struction. It would be most unusual in the absence of ascites or any note of edema elsewhere to have an intrinsic lesion of the large bowel giving rise to edema of the abdominal wall.

In the last place the x-ray showed an "irregular soft tissue tumor" in the region of the obstruction, with an area of calcification on its medial side, which would be an unusual report for a lesion arising within the bowel.

The laboratory data other than those which have already been commented upon give little added information save for the fact that she apparently had diabetes with associated acidosis. In the face of a normal temperature I should ascribe her white count of 20,000 to her diabetic acidosis, and I do not believe that the factor of infection was of primary importance.

The cecostomy apparently relieved her acute obstruction and her temperature postoperatively could easily be accounted for on the basis of the unavoidable soiling that the operation occasioned. Diverticulitis might be mentioned in connection with a lesion in this region. However, no diverticula were seen in the large bowel as visualized by x-ray, and bleeding which we know had occurred would be most unusual in diverticulitis.

The area of calcification seen by x-ray most probably was either in the ovary or in a fibroid. The presence of a pelvic tumor might easily have been missed on examination due to the degree of distention from the large bowel obstruction which was present at the time the examination was made.

My diagnosis in this case is diabetes and obstruction of the large bowel at the rectosigmoid junction. I think that the obstruction was caused by a malignancy extrinsic to the large bowel but in part invading and involving it. The most probable origin of this malignancy would be found in the pelvic organs most probably a fibroid of the uterus that had undergone malignant degeneration.

#### CLINICAL DIAGNOSIS

Carcinoma of the sigmoid

DR HENRY H. Faxon's DIAGNOSIS

Obstruction of the sigmoid from extrinsic neoplasm, probably sarcoma of the uterus

#### ANATOMIC DIAGNOSES

Adenocarcinoma probably primary in the sigmoid, with invasion of the left ovary and metastasis to the lung

Septic infarction of the lungs

Retroperitoneal abscess

Emaciation

Operative wounds. Cecostomy, colo-sigmoidostomy

## PATHOLOGIC DISCUSSION

DR TRACY B MALLORY The preoperative diagnosis in the hospital was carcinoma of the sigmoid. The patient was in such an emaciated and dehydrated state that the first operation consisted only of a cecostomy done under local anesthesia, no attempt at exploration was made. Two weeks later she was operated upon again this time through a left rectus incision. A tumor mass was found which tied together the upper end of the sigmoid, the ovary and the uterus. A note was made that the broad ligament was invaded. It was felt that resection was out of the question so an anastomosis short circuiting the growth was done between the descending colon and the sigmoid below the tumor. It was still felt that the tumor was presumably primary in the bowel. Following operation the patient showed some evidence of wound sepsis and eventually developed bronchopneumonia and died.

As Dr Faxon pointed out in his first sentence the crux of the differential diagnosis in this case was whether the bowel was obstructed by an intrinsic or an extrinsic tumor. He placed his stakes on the latter, the surgeons who had charge of the patient in the hospital on the former. At the conclusion of the autopsy I was sure that the tumor arose in the ovary but since studying the microscopic sections I am once more in doubt and feel forced to assess the balance of evidence as slightly in favor of the sigmoid origin.

At autopsy we found the left ovary and tube completely replaced by a tumor mass five cen-

timeters in diameter. This was adherent to and had apparently invaded the wall of the sigmoid. The mucosa of the sigmoid however appeared to be continuous over the tumor and showed no gross ulceration. This is so unusual for a malignant tumor of the large bowel that we had no hesitation in signing the death certificate as primary ovarian carcinoma. There was no intrinsic narrowing of the gut and the pressure of the tumor mass from without seemed certainly responsible for the obstruction as Dr Faxon predicted.

Microscopic examination of the tumor, however, proved at once interesting and surprising. The tumor turned out to be a so called adenoacanthoma, that is a carcinoma differentiating in some areas into glandular epithelium in other areas into squamous cells with epithelial pearl formation. These tumors are a well recognized entity in the endometrium and have also been noted with some frequency in the gallbladder. I have seen two of them in the lower end of the esophagus and one which was certainly primary in the large bowel. I know of no report of such a tumor arising in the ovary and am therefore inclined to swing my verdict over to a primary adenoacanthoma of the sigmoid.

The other findings of significance were a retroperitoneal abscess in the region of the intestinal anastomosis and a number of small septic infarcts in the lung. One nodule of metastatic tumor one centimeter in diameter was found in the left upper lobe of the lung.



of seventy. The chief problem in differential diagnosis is whether the primary lesion was within the lumen of the bowel or whether the obstruction was caused by extrinsic pressure. The woman's age together with the lowered red count and hemoglobin make cancer as the fundamental lesion the most likely possibility.

In favor of cancer at the rectosigmoid junction are the law of probability, the characteristic story of increasing large bowel obstruction, and the finding of a positive guaiac in the stool on the only examination quoted. However there are certain definite objections to this diagnosis which make me exclude it as my first choice.

In the first place the history tells us that there was a "sudden" change in her bowel habit only two and a half months before entry. With carcinoma of the large bowel that had gone on to complete obstruction an antecedent history dating back a longer time would be more characteristic. If we evaluate the story further it may be that a longer period of difficulty was actually present, for below the original statement comes the remark that "about six or seven months before coming to the hospital the stools were narrow and pencil like in appearance but subsequently became quite copious and remained so until the onset of her current illness, when they became extremely scanty except for an occasional large normal appearing movement." If her obstruction were due to a lesion arising in the large bowel it seems improbable to me that she would have experienced such freedom from symptoms between the time mentioned seven months before and the later date of two and a half months prior to entry which she gives for the onset of her trouble. It is not inconsistent with an obstructing lesion of the colon to have "copious" movements for if the pathology is high enough in the colon the rectum can accumulate a good deal of feces below the obstruction before the person is actually called upon to defecate. The absence of tenesmus in this case is clinical evidence that the lesion was not low which is later confirmed by the site of obstruction as demonstrated by x-ray.

The second point which seems unusual for a lesion primary in the large bowel is the relative absence of blood in the stools. It is true that some blood was present because the guaiac was positive and the patient noted that the stools had become somewhat darker. But this observation had been made only two weeks before coming to the hospital. The patient had never recognized any blood in the stools and the degree of anemia was not severe.

In the third place there is a note that not only was the abdomen distended and tympanitic but also that there was "slight edema of the abdominal wall" at the time of complete ob-

struction. It would be most unusual in the absence of ascites or any note of edema elsewhere to have an intrinsic lesion of the large bowel giving rise to edema of the abdominal wall.

In the last place the x-ray showed an "irregular soft tissue tumor" in the region of the obstruction, with an area of calcification on its medial side, which would be an unusual report for a lesion arising within the bowel.

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Septic infarction of the lungs

Retroperitoneal abscess

Emaciation

Operative wounds. Cecostomy, colo sigmoidostomy

under conditions of prolonged and extreme heat

The vulnerability of human beings to high temperatures is also proved by an increase in infant mortality of 34 per cent during the same week, which was accounted for, in a large part, by deaths in the heat zone. This increase is probably much more significant than the increase in general mortality, for children under one year of age are, ordinarily, much less liable to die following accidents or from chronic diseases, the courses of which are fatally terminated by extreme degrees of temperature

### THIS WEEK'S ISSUE

CONTAINS articles by the following named authors

CHADWICK, HENRY D. M.D. Harvard University Medical School 1895. Formerly, Superintendent of the Westfield State Sanatorium, and Tuberculosis Controller in Detroit, Michigan. Now, Massachusetts Commissioner of Public Health. Address: State House, Boston, Mass. Associated with him is

LOMBARD, HERBERT L. A.B., M.P.H., M.D. Bowdoin Medical School 1915. Director, Division of Adult Hygiene, Massachusetts Department of Public Health. Assistant Professor of Hygiene and Public Health, Tufts College Dental School. Address: 100 Nashua Street, Boston, Mass. Their subject is The Massachusetts Cancer Program. Page 265

KUHNS, JOHN G. A.B., M.D. Johns Hopkins University School of Medicine 1924. Chief of Staff, Robert Breck Brigham Hospital. Consulting Orthopedic Surgeon, Sturdy Memorial Hospital, Attleboro. Assistant Orthopedic Surgeon, Children's Hospital, Boston. Assistant in Orthopedic Surgery, Harvard University Medical School. Address: 372 Marlborough Street, Boston, Mass. Associated with him is

JOPLIN, ROBERT J. A.B., M.D. Harvard University Medical School 1929. Assistant Orthopedic Surgeon, Children's Hospital and Robert Breck Brigham Hospital. Assistant in Orthopedic Surgery, Harvard University Medical School. Address: 300 Longwood Avenue, Boston, Mass. Their subject is Convalescent Care in Chronic Arthritis. Page 268

MORRIS, ROBERT H. M.D. University of Toronto Medical School 1922. F.A.C.S. Assistant Orthopedic Surgeon, Children's Hospital, Boston. Instructor in Orthopedics, Harvard University Medical School. Consulting Orthopedic Surgeon, New England Baptist Hospital. Orthopedic Surgeon, Long Island Hospital. Address: 253 Newbury Street, Boston, Mass. Associated with him is

DOWNING, F. HAROLD. A.B., M.D. Leland Stanford University Medical School 1929. Assistant in Orthopedic Surgery, Massachusetts General Hospital. Assistant Visiting Orthopedic Surgeon, Long Island Hospital. Assistant in Orthopedic Surgery, Cambridge Hospital. Address: 253 Newbury Street, Boston. Their subject is Report of a Case of Vertical Fracture Through the Lower Tibial Epiphysis During the Period of Bone Growth and an Operation for the Correction of the Resultant Deformity. Page 272

MAY, G. ELLIOTT. A.B., M.D. Harvard University Medical School 1925. Assistant Visiting Surgeon for Gynecology and Obstetrics, Boston City Hospital. Senior Obstetrician, Newton Hospital, Newton. Assistant Obstetrician, Massachusetts General Hospital, Boston. Consultant in Obstetrics, Framingham-Union Hospital, Framingham, and Anna Jaques Hospital, Newburyport. Assistant in Obstetrics and Gynecology, Harvard University Medical School. His subject is Dehydration Therapy in the Toxemias of Pregnancy. Page 277. Address: 201 Bay State Road, Boston, Mass.

HARTWELL, CONSTANCE G. S.B., M.D. Boston University School of Medicine 1935. Now an Intern at the Massachusetts Memorial Hospitals, Boston. Address: West Newton, Mass. Associated with her is

ROWLAND, WILLIAM D. M.D. University of Michigan Homeopathic Medical School 1911. F.A.C.S. Professor of Ophthalmology, Boston University School of Medicine. Chief of Eye Service, Massachusetts Memorial Hospitals. Address: 84 Commonwealth Avenue, Boston, Mass. Their subject is The Problem of Eye Injuries. Page 290

### MISCELLANY

#### POLIOMYELITIS IN THE SOUTH

No indications are seen by U. S. Public Health Service officials that the infantile paralysis (poliomyelitis) epidemic in Alabama and Tennessee will reach national proportions. Reports from other parts of the country show no unusual amount of the disease. Federal health authorities are also encouraged by the fact that the Alabama-Tennessee outbreak is not so severe as the North Carolina epidemic of about the same time last year. Nor does it show any great tendency to spread.

Federal H. men led by Dr. Charles Armstrong have gone into the affected areas in order to aid in the application of the new nose spray which it is hoped will prevent the disease. Developed by Dr. Armstrong and Dr. W. T. Harrison as the result of experimental work on monkeys, the aluminum picric acid nasal spray is receiving its first large-scale application in this epidemic.

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## CHARLES HARRISON FRAZIER

(1870-1936)

WITH the death of Dr Charles H. Frazier of Philadelphia another landmark in the development of the special field of surgery of the nervous system is passed. With Kocher, Macewen and Horsley as a background, the stage was set in the late nineties for great advances in intracranial surgery. Harvey Cushing and Frazier were the pioneers in this country. Cushing, straight from Kocher and Sherrington, began to cut deeper into cerebral tissue and extirpate new growths more fully than any surgeon before him, always preserving the gentle touch gained from Halsted. Frazier, on his return from Berlin, first turned to general surgery. He was soon stimulated, however, by the possibilities of surgical therapy in the many patients gathered in Philadelphia then the center of neurology in America under the care of the younger and older Mitchells, Mills, Spiller and others. His work on chordotomy for the

relief of pain, for which he is best known, came as the result of co operation with Spiller. Spiller worked out the location of the spinal pain tracts, suggested the operation and Frazier supplied the surgical technique.

As time went on Frazier largely gave up general surgery and devoted his time to the removal and study of brain tumors, the surgery of trigeminal neuralgia and other forms of cranial nerve disorders, brain abscess and pituitary tumors. At the same time he continued his interest in the surgery of the spinal cord and wrote the most adequate text published in the country on the subject. For many years he almost annually reported his neurosurgical results at the meetings of the American Neurological Association. Clear-cut in both writing and in speech, he left a lasting impression on readers and hearers of sound productive scholarship. His clinic grew rapidly and many students were trained by him. Something of the driving type, a number of operations a day were not an unusual occurrence. His training in general surgery never left him, even when entering the cranial cavity. His results, however, have been exceeded by few. Frazier's best work was his earliest, on spinal cord surgery. Unfortunately he never found time to bring out successive editions of his text.

## EXTREME HEAT vs HUMAN BEINGS

THE figures given in the *Weekly Health Index*, published by the Bureau of the Census, Department of Commerce, Washington, for the week ending July 18, 1936, might well be used by the New England Council as propaganda in recommending New England as a summer resort.

During the week reported, there were 12,163 deaths in eighty-six large cities compared with 7,439 in 1935, an increase of 4,744 or 64 per cent. If one considers the figures for the individual cities it is found that the average increase in mortality for mid-western cities in the extreme heat zone was over 200 per cent. Peoria had an increase of 680 per cent and St. Paul one of 400 per cent. During the same period there was an increase in mortality in fourteen New England cities of only 2 per cent, a figure well within the normal year-to-year fluctuation. It is interesting to note that in eight southern cities, where the residents are accustomed to sustained heat, the average increase in mortality was only 25 per cent.

While it is realized that many of these deaths were accidental in the course of activities, such as boating and swimming, which are increased during extremely hot weather there is no doubt but that many human machines, normally attuned to a temperate climate are unable to perform their functions and tasks.

tice in this country What are the more important considerations that have contributed to this change in the treatment and management of pulmonary tuberculosis? J W Cutler physician in charge of the pneumothorax clinic Henry Phipps Institute discusses this subject in an article in the *Journal of the American Medical Association* of April 18 1936

#### NATIONAL MEDICAL COUNCIL ON BIRTH CONTROL

The National Medical Council on Birth Control was organized in June, 1936 for the following purposes

- 1 To control and supervise all medical policies of the American Birth Control League
- 2 To initiate, encourage and execute appropriate scientific research in the medical aspects of birth control

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#### ABSTRACTS OF TWO PAPERS READ AT THE ROCHESTER MEETING OF THE AMERICAN ASSOCIATION AND ASSOCIATED SOCIETIES

Experiments on the effect of the new neutron rays of science to produce biological changes in living organisms show that they are much more efficient than x-rays according to Dr Raymond E Zirkle Johnson Foundation for Medical Physics at the University of Pennsylvania. Ultimate hope of the investigators Dr Zirkle revealed is that the neutron rays will be more destructive to tumorous tissue than to normal body tissue and that medical science will thereby have a more potent radiation with which to attack cancer. He stated that 'the results to date do not justify the prediction of such an extremely fortunate outcome but are nevertheless distinctly encouraging. The neutron—one of the fundamental building blocks out of which atoms are built—was not discovered until 1932. Even yet the sources for creating neutron beams for biological study are so weak that only beams of low intensity can be used. But the encouraging thing is that the effectiveness of neutrons in ionizing tissue (which is the way all rays act on biological material) is always greater than x-rays for equal incident intensities. The relative effectiveness has been found to be from three to ten times in favor of the neutrons. Moreover and still more encouraging the neutron x-ray ratio of effectiveness is not the same

In the hope of saving some of those who might otherwise fall victims the nasal spray is being used without any attempt at making a controlled experiment. Physicians and health officers are administering the spray, which is quite harmless to those who desire it and who can be treated with the facilities available. Undoubtedly a study will be made later to determine whether any cases of poliomyelitis occur among those who are treated with the spray but there is no systematic exclusion of some from the treatment in order to have a normal group in which the disease might have an unhampered chance to spread as would be the case if the doctors were conducting a laboratory experiment.

U. S. Public Health Service officers are careful to state that the alum picric acid spray method is "based entirely upon animal experimentation and is not at present to be regarded as of proved value in the prevention of poliomyelitis in man." Nevertheless they are hopeful that it will prove effective in preventing the disease and that this epidemic may give some evidence to that effect.

In last year's North Carolina epidemic there was experimental use of vaccines designed to provide artificial immunity to the disease. In the time subsequent to that use medical opinion has developed which has indicated that vaccines should not be used.—*Science Service*

#### STATEMENT REGARDING NASAL SPRAY AS PREVENTIVE OF POLIOMYELITIS

The recent experimental work by Drs. Armstrong and Harrison in preventing poliomyelitis in monkeys by the use of a nasal spray has excited so much interest and speculation that the Public Health Service deems it desirable to issue the following statement.

The evidence regarding this method is as yet based entirely upon animal experimentation and the proposed spray is not at present to be regarded as of proved value in the prevention of poliomyelitis in man. It may be advisable to await the results of further trials before giving the method general application. If however, it is desired to use the solution it should be sprayed into the nostrils three or four times on alternate days, and thereafter weekly during the presence of poliomyelitis. The spray tip should be pointed upward and backward at an angle of about 45°, and the spraying should be thorough enough to reach the pharynx as well, when a bitter taste will be noted. The early applications at least should be administered by a physician. The experimental work on animals is still being pursued. The tentative procedure is therefore subject to such changes as may be dictated by future findings.

The most effective solution so far developed during experimentation on monkeys is prepared as follows:

**Solution A** Dissolve 1 gram of picric acid in 100 cc of physiological salt solution (0.85 per cent) (Warming facilitates solution of the picric acid.)

**Solution B** Dissolve 1 gram of sodium aluminum sulphate (sodium alum) in 100 cc of physiological salt solution (0.85 per cent). Any turbidity in this solution should be removed by filtering one or more times through the same filter paper.

Mix solutions A and B in equal amounts. The resulting mixture which contains 0.5 per cent picric acid and 0.5 per cent alum is sufficiently antiseptic to prevent the growth of organisms and is ready for use as a spray. Home made concoctions are not favored.—*Public Health Reports* 51:978 (July 17) 1936

#### VIOLATORS OF FOOD AND DRUG LAW FINED

Shippers of dairy products, fish, nut meats, tomato products, fresh vegetables, macaroni and medicines, were brought before the Federal courts during June on a variety of charges; the current report of the Food and Drug Administration shows fines totaling \$6,175 were assessed, with costs added in some instances.

Two other cases involving substandard pharmaceuticals were terminated during June, resulting in a fine of \$200 to the G. W. Carrick Co., Newark, N. J., and one of \$50 to the Cheplin Biological Laboratories, Inc., Syracuse, N. Y. In Cleveland, Ohio, a federal district judge overruled a demurrer to the information charging violation of the Food and Drugs Act in the shipment of a product labeled 'Epsom Salt Compound Tablets.' The manufacturer—Strong Cobb & Co.—contended that the word 'compound' in the name of the drug was sufficient notification of the inclusion of powerful laxatives that the Administration contends the purchaser would not expect. The predominantly active ingredients in these tablets were shown by analysis to be phenolphthalein (a coal tar laxative) and an extract of the laxative drug aloë. Although Epsom salt was in fact present, the quantity of it fell far short of even a mild dose, the product actually depending for its effect upon the drug ingredients that were neither announced on the label nor indicated in the name of the preparation.

The report of the termination of one patent medicine case concludes the June statement of prosecutions involving drugs. Henry Lutzenkirchen trading as the Ora Noid Co., Chicago, Ill., dropped his intended contest of the government's case against him based on a shipment of his product 'Ora Noid' and was fined \$50 and costs. Ora Noid, half table salt and the remainder consisting of chalk, baking soda, magnesium and potassium sulphates and phosphates, flavored with an essential oil, was offered as a complete oral prophylactic. These fraudulent claims have now been removed from the labeling of the product.—*U. S. Department of Agriculture*

#### TUBERCULOSIS ABSTRACTS

The year Koch announced the discovery of the tubercle bacillus, 1882, Forlanini published his first paper on pneumothorax. Yet only during the last decade has collapse therapy become accepted practice.

search and in the history of medicine and for his archaeological and ethnological explorations and studies. His scientific achievements range from pioneering and the use of aerial photography in the making of archaeological surveys to the establishing of a number of research institutions.

During the World War Sir Henry placed his scientific institutions at the service of the British Government. He instituted a Commission to improve design and construction of army ambulances. For use in Palestine and Egypt during the war he constructed equipped and supplied for the British Army Medical Service a chemical and bacteriological motor field laboratory. It was at this period that he became a British subject by naturalization.

In 1928, the honorary degree of Doctor of Laws was conferred upon him by the University of Edinburgh. In recognition of his life's work and generous support of medical research, he was knighted by the late King George V in 1932, and in 1936 was awarded the Croix d'Officier de la Legion d'Honneur by the French Republic. In 1936 the Spanish Republic awarded him the decoration of Comendador de la Orden de la Republica in recognition of his outstanding services to Spanish interests.

Apart from the experimental research laboratories of the establishments of Burroughs Wellcome & Co. which have to their credit an immense number of important original researches, Sir Henry has established a number of scientific institutions which are co-ordinated and under separate and distinct direction including the following:

The Wellcome Physiological Research Laboratories—London—(1894)

The Wellcome Chemical Research Laboratories—London—(1896)

The Wellcome Bureau of Scientific Research—London—(1913) and the Museum of Medical Science (including Tropical Medicine and Hygiene, 1914) and the Auxiliary Entomological Research Laboratory at Claremont, Essex—Surrey—(1915)

The Wellcome Tropical Research Laboratories—Khartoum, Anglo-Egyptian Sudan, Upper Nile, Africa—(1901) and the fully equipped Auxiliary Floating Tropical Research Laboratory on the Upper Nile and its tributaries—(1906)

As an energetic and public spirited man, Sir Henry held memberships in numerous medical, archaeological, geographic and similar societies. He also received many honorary degrees in recognition of his scientific achievements and public benefactions.

## NOTICES

### AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY

The next written examination and review of case histories of group B applicants by the American

Board of Obstetrics and Gynecology will be held in various cities in the United States and Canada on Saturday, November 7, 1936.

Application blanks and booklets of information may be obtained from Dr. Paul Titus, Secretary, 1015 Highland Building, Pittsburgh (6), Pennsylvania. Applications for this examination must be filed in the Secretary's Office sixty days prior to the scheduled date of examination.

### FISKE FUND PRIZE ESSAY 1937

The Trustees of the Fiske Fund announced at the annual meeting of the Rhode Island Medical Society, held in June 1936, that they proposed the following subject for the year 1937—Newer Methods of Prevention and Treatment of Acute Anterior Poliomyelitis.

For the best essay on the subject worthy of a premium, they offer the sum of two hundred and fifty dollars (\$250.00). Every competitor for the premium is expected to conform with the following regulations, namely:

To forward to the secretary on or before the first day of May, 1937, free of all expense, a copy of his dissertation with a motto thereon and also accompanying it a sealed envelope having the same motto inscribed on the outside and his name and address within.

Previously to receiving the premium awarded the author of the successful dissertation must transfer to the Trustees all his right title and interest in and to the same for the use, benefit and behoof of the Fiske Fund.

Letters accompanying the unsuccessful dissertations will be destroyed unopened by the Trustees, and the dissertations may be procured by their respective authors if applications be made therefor within three months.

The essays must be typewritten and should not exceed 10,000 words. If an essay be illustrated, such illustrations will be published at the expense of the author.

John E. Donley, M.D., Providence, R. I.; Walter C. Rocheleau, M.D., Woonsocket, R. I.; James W. Leech, M.D., Providence, R. I.—Trustees.

Wilfred Pickles, M.D., Secretary to the Trustees, 154 Waterman Street, Providence, R. I.

### THE CANCER INSTITUTE

The first Cancer Institute will meet on September 7, 8 and 9 at the University of Wisconsin. Dr. William D. Stovall, director of the State Laboratory of Hygiene at the university, is chairman of the committee in charge.

Investigators from abroad who will speak at the general sessions and who will lead round table discussions include Dr. Liev Krevberg, of the University of Oslo; Professor Henry Contard, chief of the department of x-ray therapy for cancer of the Radium Institute at the University of Paris; and Dr. Madge Thurlow Macklin, associate professor of histology and

dated to select the doctor they wish to have treat them

Yours very truly

GEORGE J BASSOW MD

193 Main Street  
Athol Mass

# ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

535 North Dearborn Street Chicago Illinois  
August 4 1936

Managing Editor

*The New England Journal of Medicine,*

In addition to the articles enumerated in our letter of June 30 the following have been accepted

Lederle Laboratories

Ash Pollen Antigen—Lederle

Beech Pollen Antigen—Lederle

Hickory Pollen Antigen—Lederle

Poplar Pollen Antigen—Lederle

Sycamore Pollen Antigen—Lederle

Sharp & Dohme, Inc

Tetanus Gas Gangrene Antitoxin Mixed — Mulford

E R Squibb & Sons

Gas Gangrene Antitoxin—Squibb

Tetanus Gas Gangrene Antitoxin—Squibb

Yours sincerely,

PAUL NICHOLAS LEECH Secretary

## RECENT DEATH

**MCDONALD**—**WILLIAM McDONALD, MD** formerly of Providence, Rhode Island, but since 1924 a resident of Marlon, Massachusetts died at his home, August 1, 1936, after a long illness

Dr McDonald was born in Albany, New York in 1873 and graduated from Columbia University College of Physicians and Surgeons in 1899. He was a Fellow of the Massachusetts Medical Society and the American Medical Association and was a specialist in Neurology and Psychiatry. When President Roosevelt was suffering with anterior poliomyelitis, Dr McDonald was his physician.

Dr McDonald's wife Elizabeth Hurkamp McDonald died in January, 1934. Three brothers survive him: Donald of New York and Hyannisport, Albert of Garden City, L I and Frederick of Albany, as do two sisters: Mrs Harry Taylor and Miss Frances McDonald.

## OBITUARY

### SIR HENRY WELLCOME

In his eighty third year Sir Henry Wellcome died in London on July 25 following an operation. Born in 1853 in a log cabin near Almond, Wisconsin, about 125 miles from Milwaukee, he was the son of an itinerant missionary, the Rev S C Wellcome, who with his wife Mary Curtis Wellcome traveled in a

covered wagon in Wisconsin and Minnesota and preached among the Indian settlements.

At an early age he began his career as a pharmacist in Rochester, Minnesota, where he worked from 1868 to 1871. It was there that he came under the notice of Dr William Wardell Mayo, father of Dr William J Mayo and Dr Charles H Mayo, founders of the Mayo Clinic. Sir Henry was a boyhood friend of the Mayo brothers and this friendship was continued during his life.

The senior Dr Mayo encouraged Sir Henry to study pharmacy and later arranged for his matriculation at the Chicago College of Pharmacy. During his attendance the Chicago Fire destroyed the college and he then enrolled at the Philadelphia College of Pharmacy. At the age of twenty-one he was graduated as a member of the Class of 1874. In the days of Proctor, Maisch, Bridges and Remington.

Following his graduation from the Philadelphia College of Pharmacy, Sir Henry spent a few years in the retail drug business in New York. Later he took a position with the firm of McKesson and Robbins and as their representative traveled extensively throughout the United States and Mexico.

Sir Henry left New York for London, and in 1880 with the late Siras M Burroughs established the firm of Burroughs Wellcome & Co, manufacturers of fine chemicals and galenicals. Mr Burroughs died in 1895, and since that time Sir Henry served as the head of Burroughs Wellcome & Co. In addition to the London organization, the firm has establishments in the United States, Italy, Canada, Australia, India, China, and other countries.

Sir Henry's American interests were wide and varied. He had been a life member of the American Pharmaceutical Association since 1875, and always took an active interest in its scientific work. In 1934 he was the Honorary President of the American Pharmaceutical Association and also was awarded the Remington Honor Medal for his scientific and other valuable contributions to pharmacy. In 1934 he received the honorary degree of Doctor of Science conferred by Marquette University, Milwaukee, Wisconsin.

As a result of Sir Henry's experience and interest in tropical research, Secretary of War the Hon J M Dickinson appointed him to visit Panama and make a survey of sanitary conditions and methods of operation in all sections of the Canal Zone, and to submit an unbiased report based on his personal observations. The report of Sir Henry's survey secured a free hand for General Gorgas in continuing his monumental sanitary work in Panama.

Sir Henry was one of the sponsors and a director of the Gorgas Memorial Institute of Tropical and Preventive Medicine in Washington, operating scientific laboratories at Panama for research work touching causes and prevention of tropical diseases.

Sir Henry received world wide recognition for his great services and princely contributions to science and medicine for his interest in missionary enterprises and for his personal work in medical re-



until the present time Nine months ago she experienced an attack of fainting and was extremely weak following it remaining in bed for three months Two and a half weeks before entry to the hospital she began to experience coldness of the hands and feet and frequent fainting attacks The frequency of the latter increased and she experienced ten a day at the time of admission Physical examination showed pale cyanotic extremities moist with perspiration The radial pulse varied between fourteen and thirty beats per minute An electrocardiogram showed regular auricular and ventricular rates, with complete dissociation of the two She was given fifty milligrams of ephedrine every four hours which elevated the pulse rate and made her comfortable until she began to experience attacks of ventricular tachycardia accompanied by fainting The dose of ephedrine was decreased, which eliminated the tachycardia and fainting spells The patient was presented as a case of complete heart block

Dr Henry A Christian pointed out that symptoms were often the same whether the heart beat too fast or too slowly Dr Samnei Levine stated that there was probably some relation between Adams-Stokes disease and diphtheritic infection at an early age There is also some relation between this condition and gallbladder disease If it is possible to rule out acute coronary disease many cases of Adams-Stokes' disease will be found to have a history of one of the above conditions In patients such as the one presented it is important to keep the heart rate regular at about thirty beats per minute Too much ephedrine will precipitate ventricular fibrillation, and too little will allow the ventricle to beat too slowly

The surgical case was presented by Dr R L Peterson A fifty-five year old white housewife entered the hospital three weeks previously complaining of vaginal and rectal bleeding of one year's duration The menopause had occurred ten years previously, and except for slight leucorrhea of two years duration there had been no vaginal discharge until the onset of the present illness Three years ago she experienced heart attacks and dyspnea, and had been treated with digitalis One week before admission she began to notice a tingling sensation and a feeling of numbness in her left hand Physical examination on entry revealed cyanosis and coldness of the fingers of the left hand The radial pulse was not palpable although brachial pulsations were felt at all times The blood pressure in the left arm was 140/70 mm. of mercury X-ray examination showed that there was no cervical rib Pelvic examination showed a large friable mass in the cervix with multiple implants on the vaginal walls A biopsy of this mass proved it to be a carcinoma and 3000 milligram hours of radiation therapy were given The left hand became progressively colder and more cyanotic and the brachial artery was explored at its bifurcation No obstruction was found although the pulsations were of poor quality It was decided that there was some obstruction higher

in the arterial system of the left arm Treatment with alternate pressure and suction to the left hand and forearm was instituted with some improvement

Dr Elliott C Cutler stated that he believed that the symptoms in this case were caused by a 'silent embolus' in the axillary artery

The paper of the evening was delivered by Florence R. Sabin M.D., Member of the Rockefeller Institute for Medical Research, New York City who spoke on the subject "Development of the Cells of the Blood and Bone Marrow" Dr Sabin's studies were carried out on embryos and young rabbits comparative counts of the various forms of cells in the blood and bone marrow being made In fetal life the hemoglobin is higher in percentage than would be expected from the number of red blood cells present in the blood stream There is thus a sort of primary anemia present which is not corrected until the third month of extrauterine life Dr Sabin interprets this as indicating that the very young rabbit can produce hemoglobin with ease, but that its ability to form new reticulocytes is imperfect until the 'extrinsic' and 'intrinsic' factors come into play

Shortly after the birth of the animal there is a "flooding" of the blood stream with large numbers of immature red blood cells chiefly reticulocytes which are derived from the liver Then during the first week of life there is a true fall in the number of circulating red blood cells as indicated by a drop in the reticulocyte count At the end of this time there is a rapid increase in the erythrocytes and the normal adult level is reached by the end of the third week of life

This rise in the number of red blood cells takes place during the time that there is an extremely rapid growth of bone and bone marrow Counts of the marrow cells (using the supravital staining technique) showed that members of the red blood cell series were in predominance during the first week of life, but these could not be passed out into the blood stream because they were not yet mature They become mature during the second week of life the time when the red count in the peripheral blood stream begins to rise

There are two theories as to the exact site of origin of the red cells in the marrow One school holds that they are formed extravascularly the other that they originate and grow within the sinusoids Evidence is not conclusively in favor of either theory but Dr Sabin has demonstrated microscopically many groups of immature red cells living within the sinusoidal walls No one has yet proved that the red cell has any power of motility, which would enable it to enter the vascular system if it did originate extravascularly These two facts point toward an intravascular origin of the erythrocyte

The monocytes reach their full quota in the blood during the first week of life but the neutrophils are held down during the whole first month of life by the drive for red cells The lymphocytes rise rapidly during the first month to their normal level

embryology at the University of Western Ontario

Americans who are expected to present papers are Dr C C Little director of the Roscoe B Jackson Laboratory for Cancer Research at Bar Harbor Me, Dr Edgar Allen, chairman of the department of anatomy of the Medical School of Yale University, Dr H B Andervont, biologist of the U S Public Health Service at Boston, Mass, Dr S P Reimann, pathologist and director of the Research Institute of the Lankenau Hospital and professor of experimental pathology in the Graduate School of the University of Pennsylvania Dr Emil Novak associate gynecologist at the Johns Hopkins Medical School Dr J B Murphy, director of cancer research at the Rockefeller Institute for Medical Research, Dr James Ewing, professor of oncology at the Cornell University Medical School, member of the staff of the Memorial Hospital for the treatment of cancer New York Dr Gioacchino Failla, physicist at the Memorial Hospital and Dr Warren H Lewis, of the department of embryology of the Carnegie Institution of Washington, at Baltimore

The expenses of the conference are being defrayed by the Wisconsin Alumni Research Foundation—*Science*, August 7, 1936

#### HARVARD UNIVERSITY TERCENTENARY CELEBRATION

##### SCHOOL OF PUBLIC HEALTH

Attention is called to the previous publication on page 1166 of the June 4 issue of the *Journal* of the details of the program of the Harvard University School of Public Health The Symposium on the Environment and Its Effect Upon Man will be held August 24 to 29 at the School of Public Health 55 Shattuck Street, Boston

#### REMOVALS

JOHN P MOYRS, MD announces the removal of his office from 264 Beacon Street to 330 Dartmouth Street Boston Telephone Commonwealth 4314

HARRY B LEVINE, MD announces the removal of his office from 471 Commonwealth Avenue to 483 Beacon Street Boston Telephone Kenmore 8000

### REPORTS AND NOTICES OF MEETINGS

#### MIDDLESEX NORTH DISTRICT MEDICAL SOCIETY

The quarterly meeting of the Middlesex North District Medical Society was held at the Vesper Country Club July 29 1936, and the Moses Greely Parker luncheon was served to seventy Fellows

Doctors Huber and Wakefield representing the State Department of Public Health explained to the Councillors the plan for carrying out the project for

services to crippled children, which is to be financed from funds provided by the Social Security Act.

The subject is to be referred to a special committee, which will consult with Doctors Huber and Wakefield at a later date

Dr Tighe gave a complete report for the Public Relations Committee The meeting showed that the younger men intend to be active in the work of our Society, which augurs well for the future

Dr Charles Mongan and Dr Alexander Begg President and Secretary of the State Society respectively gave interesting talks on some of the problems of the Society which were well received The meeting was unusually large for our summer meeting

FREDERICK P MURPHY, President

#### THE SOUTHWESTERN MASSACHUSETTS ASSOCIATED BOARDS OF HEALTH

The annual meeting of the Southeastern Massachusetts Associated Boards of Health was held at Fort Phoenix, Fairhaven on Wednesday, July 29 The result of the election was the following list of officers for the coming year —

President, Dr T L Swift, Falmouth

Vice Presidents, Joseph Christie, Dartmouth, Harold T Cleveland, Dartmouth

Secretary Treasurer, George F Crocker, Jr, Marston Mills

Executive Committee, Dr R P MacKnight New Bedford, F W Deiano, Fairhaven, and Dr W O Hewitt, Attleboro

Routine business was transacted, but no papers were presented There was the usual clambake

#### HARVARD MEDICAL SOCIETY

The last meeting of the Harvard Medical Society for the current year was held on May 12, 1936 at the Peter Bent Brigham Hospital, Dr George B Wislocki presiding

The medical case of the evening was presented by Dr William Clauser A sixty-nine year old white female entered the hospital three and a half weeks previously complaining of frequent attacks of severe pain in the precordial region. Her family history was of interest, since practically all members in her own generation had died of arteriosclerosis and heart disease One member of the family had died, at the age of eighty, of diabetes Her past history was negative, and there was no history of diphtheria or any disease involving the heart She had been well until four and a half years previously at which time during an examination for minor complaints, her blood pressure had been found to be 190 mm of mercury Two and a half years previously she fainted fell and injured herself Except for extrasystoles no abnormalities were found in the cardiovascular system She was next seen two years ago at which time electrocardiographic studies showed bundle branch block Her pulse rate at that time was 140 beats per minute She was digitalized and continued to take digitalis

## Saturday, August 22—

\*10 a m - 12 m Staff Rounds at the Peter Bent Brigham Hospital Conducted by Dr Reginald Fitz

\*Open to the medical profession  
†Open to Fellows of the Massachusetts Medical Society

August 24 29—Harvard University Tercentenary Celebration See page 1166 Issue of June 4 School of Public Health page 310 of this issue

September 4 to 8—First Congress of the Austrian Society for the Study of Roentgenology For details address Allgemeines Krankenhaus Alserstrasse 4 Wien IX before September 1

September 7, 8, and 9—The Cancer Institute See page 309

September 7 10—International Union against Tuberculosis See page 554 Issue of March 12

September 7 11—American Congress of Physical Therapy will meet at the Waldorf-Astoria, New York City See page 62 Issue of July 2

September 9 to 12—Sixth Congress of the International Society for Urology For details address Dr Theodor Hryntschak Rathausstrasse 3 Wien I

September 14 and 15—Tercentenary Session of the Harvard Medical School See page 1166 Issue of June 4

September 16 21—First International Congress of Sanatoria and Private Nursing Homes See page 803 Issue of April 16 and page 264 Issue of August 6

September 22, 23 24—Twelfth Clinical Congress of the Connecticut State Medical Society See page 217 Issue of July 30

October 12 18—Third International Congress on Malaria. See page 1076 Issue of May 21

October 19 23—Clinical Congress of the American College of Surgeons See page 180 Issue of January 23

October 19 31—1936 Graduate Fortnight of the New York Academy of Medicine See page 1221 Issue of June 11

October 20 22—Academy of Physical Medicine Annual Meeting Hotel Statler Boston

October 20 23—The American Public Health Association See page 1226 Issue of June 11

March 30 April 2, 1937—First International Conference on Fever Therapy Postponement notice See page 52 Issue of July 2

April 21 24, 1937—American Society for Experimental Pathology See page 1076 Issue of May 21.

## DISTRICT MEDICAL SOCIETY

## WORCESTER DISTRICT MEDICAL SOCIETY

September 16 1936 May 12, 1937—See page 312

## BOOK REVIEWS

Handbook of Bacteriology For Students and Practitioners of Medicine Joseph W Bigger 458 pp Fourth Edition Baltimore William Wood & Company \$4 25

The author has attempted to present the sciences of bacteriology and immunology in a small text of 443 pages—an impossible task Too much of the book is devoted to a description of simple techniques (fully a page is occupied with a description of how to focus a microscope) Such procedures have received abundant description already and are best taught students by laboratory instructors

The subject matter is presented in a general manner without detail For this reason the book is a broad descriptive outline Much is lacking in the way of useful detailed information a fact which detracts from its value for medical students the medical profession public health officers and laboratory workers

The information given is accurate and is presented in a simple clear style It should be an excellent text for a general course in bacteriology for under graduate college students and nurses It is not adequate for more comprehensive courses or for courses

intended to prepare students for actual work in bacteriology There are a number of similar texts of equal merit on the market at the present time

La Rate en Pathologie Sanguine E Houcke 154 pp Paris Masson et Cie 45 fr

The present monograph contains the author's results of ten years research on the pathologic anatomy of the spleen For the most part these were conceived with the changes that occur in this organ in pathologically altered blood states The work is divided into four parts The first subdivision deals with the changes in the spleen in the various leukemias Also included in this section are studies of Vaquez's disease and tuberculosis of the spleen. The second portion is composed of descriptions of the splenomegalies accompanying reticulo-endothelial changes, Gaucher's disease leukemia with monocytosis and lymphogranulomatosis The third division contains observations of changes occurring in connection with pernicious anemia and hemolytic icterus The last chapter is devoted to circulatory disturbances of the spleen, particularly splenic infarct and Banti's disease An extensive bibliography and a number of excellent photomicrographs accompany the text. The book is a distinct contribution to either the consideration or study of the spleen and should prove of particular value to the pathologist and the hematologist.

Clinical Diagnosis by Laboratory Methods. A Working Manual of Clinical Pathology James Campbell Todd and Arthur Hawley Sanford Eighth Edition, Thoroughly Revised 792 pp Philadelphia and London W B Saunders Company \$6 00

The eighth edition of this standard text will be welcomed by laboratory workers throughout the country The growth of a specialized field of clinical pathology is well attested by the comparison of this with the first edition which was one of the pioneers in the field published in 1908 This handbook has the advantage of presupposing very little experience on the part of the technician, so that the tests are outlined in much detail and all its steps clearly given The procedures are well selected and generally recognized as standard Those experienced in this field will recognize that it is a guide and handbook rather than a reference book For the practitioner who wishes to keep his hand in at a little laboratory work, and for the inexperienced technician, it will be of great value Illustrations are numerous and clear

The Next Hundred Years The Unfinished Business of Science C C Furnas 434 pp Baltimore The Williams & Wilkins Company \$3 00

A visit to the recent Century of Progress resulted in this book. Pointing to the dubious nature of much of our progress, the author traces from Biology to the Social Consequences the results of much scientific endeavor and charts future developments Few

By means of supravital staining of marrow from fetal animals Dr Sabin has been able to identify a 'primitive cell,' which she believes is the parent from which both the red and white cell series are derived. In very young embryos this cell is the only one found in the marrow, but at birth it composes only 15 per cent of the total, and in later life falls to but 5 per cent of the total. In the pathological conditions of agranulocytosis and combined anemia and leucopenia there is an absolute increase in the number of these primitive cells present.

A detailed study of the monocytic series has convinced Dr Sabin that monocytes are to be regarded as a more youthful form of the macrophage, which it becomes with increase in its age. Both cells have many points of similarity between them, e.g. active phagocytosis, and motility by means of a veil.

Dr Sabin has studied the phagocytic properties of monocytes, macrophages, and epithelioid cells by observing their reactions to injections of waxes, tuberculo-proteins, complex polysaccharides and phosphatides. Waxes are taken up by cells of the monocytic series, which fuse and form giant cells. After a rather prolonged period these giant cells are able to disperse the wax, and dispose of it. Tuberculo-protein is phagocytized in a similar fashion and stimulates the production of monocytes and a few epithelioid cells. The phosphatide gives a pure reaction of epithelioid cells and causes the production of a typical tubercle. The tuberculo-polysaccharide after intraperitoneal injection calls leucocytes from the blood stream, and so damages them that they are subsequently phagocytized by the macrophages of the 'milk spots' of the omentum. (The 'milk spots' are accumulations of monocytes and macrophages with an occasional "primitive cell".) These leucocytes are absorbed in the vacuole of the macrophage by an enzymotic process. As a result of these studies Dr Sabin has concluded that the epithelioid cell should be considered as a cell that has phagocytized some material which it cannot dispose of due to the fact that it is not physiologically adapted to break down very complex molecules. These cells eventually die forming a caseous mass, which in turn may be phagocytized by other epithelioid cells.

Dr Sabin pointed out that the fall in lymphocytes in the blood stream which occurs in cases of tuberculosis, syphilis and cancer parallels loss of weight and falling resistance. During this same time there is a rise in the number of monocytes.

#### WORCESTER DISTRICT MEDICAL SOCIETY 1936 1937

Wednesday September 16 1936 — The Milford Hospital, Milford Mass

4 30 p m Visitation of the Milford Hospital unit which has been recently refinished and added to

6 15 p m Dinner — complimentary by the hospital

7 30 p m Scientific program and business session. Speakers and subjects to be announced later

Wednesday evening October 14, 1936—Rutland State Sanatorium, Rutland, Mass

6 15 p m Dinner — complimentary by the State Hospital

7 30 p m Business session and scientific program. Speakers and subjects to be announced in a later issue of the *Journal*

Wednesday evening, November 11 1936 — Grafton State Hospital, North Grafton, Mass

6 15 p m Dinner — complimentary by the hospital

7 30 p m Business session and scientific program

Wednesday evening December 9, 1936—St Vincent Hospital, Worcester, Mass

6 15 p m Dinner — complimentary by the hospital

7 30 p m Business session and scientific program

Wednesday evening, January 13, 1937 — Worcester City Hospital, Worcester, Mass

6 15 p m Dinner — complimentary by the hospital

7 30 p m Business session and scientific program

Wednesday evening, February 10, 1937—Worcester State Hospital, Worcester, Mass

6 15 p m Dinner — complimentary by the hospital

7 30 p m Business session and scientific program

Wednesday evening March 10, 1937—The Memorial Hospital, Worcester, Mass

6 15 p m Dinner — complimentary by the hospital

7 30 p m Business session and scientific program

Wednesday evening, April 14, 1937 — Worcester Hahnemann Hospital, Worcester, Mass

6 15 p m Dinner — complimentary by the hospital

7 30 p m Business session and scientific program

Wednesday afternoon and evening May 12 1937—Annual Meeting. Time and place for this meeting will be announced in an early spring issue of the *Journal*

ERWIN C MILLER, M.D., Secretary

#### SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK  
BEGINNING MONDAY AUGUST 17, 1936

Wednesday, August 19—  
112 m Clinico-Pathological Conference Children's Hospital

# The New England Journal of Medicine

VOLUME 215

AUGUST 20, 1936

NUMBER 8

## The Massachusetts Medical Society

### SECTION OF DERMATOLOGY AND SYPHILOLOGY

Municipal Auditorium, Springfield, Monday, June 8, 1936

#### PRESIDING

Dr Harvey P Towle, Boston Chairman.  
Dr Rudolph Jacoby Boston Secretary

**CHAIRMAN TOWLE** The meeting will please come to order. The first business to come before it is the report of the Nominating Committee and the Election of Officers. May we hear from Dr Boardman, the Chairman of the Committee?

**DR. BOARDMAN** The Committee nominated as Chairman Dr C Morton Smith and as Secretary Dr J Harper Blaisdell.

**THE CHAIRMAN** You have heard the report of the Committee. What is your pleasure?

**A MEMBER** I move that the report of the Committee be accepted and that the Secretary cast one ballot for the Nomination and Election of Officers.

The Secretary cast a ballot electing Dr C Morton Smith Chairman and Dr J Harper Blaisdell Secretary.)

**THE CHAIRMAN** Before I begin there is one thing I wish to say to you and that is we will have a round table discussion at luncheon at the Hotel Kimball following this session at approximately 1.45 if there are enough present to have one. I wish the men here who expect to attend would kindly raise their right hands.

The Secretary recorded the members desiring to attend.)

**THE CHAIRMAN** The first paper on the program is by Dr Francis M Thurmon, of Boston on Bismuth Ethyl Camphorate. Clinical Observations on a New Oil Soluble Bismuth in the Treatment of Syphilis.

### BISMUTH ETHYL CAMPHORATE\*

#### Clinical Observations On A New Oil Soluble Bismuth In The Treatment of Syphilis

BY FRANCIS M THURMON, M.D.†

OF the eighty-odd bismuth preparations that may be offered to physicians for use in the treatment of syphilis, there are two main classifications, namely, the soluble and the insoluble groups. Of the soluble group there are two types, the aqueous solutions and those that are soluble in oil. It is with the latter, an oil soluble bismuth, that this paper deals.

Clinical experience with the bismuth compounds points to the liposoluble preparations as being the best form of this metal for intramuscular injection at seven-day intervals. This is because the oil soluble preparations possess an optimum rate of absorption and elimination and a superior ability to penetrate the tissues. On the basis of absorption and elimination alone the liposoluble preparations lie somewhere between the extremely motile aqueous solutions and the less motile bismuth suspensions.

From the Department of Dermatology and Syphilology and the Division of Research of The Boston Dispensary.

The Bismuth Ethyl Camphorate used in this study was furnished by The Upjohn Company, Kalamazoo, Michigan.

Read at the Annual Meeting of the Massachusetts Medical Society, Section of Dermatology and Syphilology, Springfield, June 5, 1936.

†Thurmon, Francis M.—Physician in Chief of the Clinic of Dermatology and Syphilology at the Boston Dispensary. For record and address of author see "This Week's Issue" page 562.

If a liposoluble bismuth possesses the properties of stability, treponemicidal effectiveness, resistance building qualities, adequacy from the standpoint of serologic response, and manifests a low degree of toxicity when other drugs are not tolerated, then that bismuth should be given careful consideration. The following data represent an eighteen months' study of such a liposoluble compound. This study, then, is a clinical evaluation of a new bismuth synthetic, bismuth ethyl camphorate, which was submitted for clinical testing in August, 1934.

Bismuth ethyl camphorate is a new oil soluble salt of bismuth. It is a pure organic compound made by the interaction of ethyl sodium camphorate and bismuth nitrate. Upon analysis the bismuth content agrees with the theory required by the formula  $C_{36}H_{57}O_{12}Bi$  (23.47 per cent Bi). It melts at  $57^{\circ}C$  and is soluble in oil and oil solvents.

Acute toxicity experiments using albino rats show the drug to be tolerated intramuscularly in doses somewhat larger than 250 mg of metallic bismuth per kilogram rat. All of the rats at the 250 mg dosage survived while those receiving 400 mg per kil-

facets of life have been omitted in this provocative work, worthy of the best efforts of such a noted leader as C. C. Furnas. With the collateral reading suggested, one could profitably spend many months following indicated leads. Facility and lucidity of expression characterize humorous suggestion intermingled with restraint that make the work doubly interesting, holding the reader to the very last. One can but agree with Furnas when he deplores the narrow specialization of today, yet the average individual, unless endowed with more than normal capacity, can hope to cover but small parts of the enormously wide field of his own work. To the doctor still interested in the range of science beyond the bread and butter type, the reviewer earnestly recommends this very readable work.

**Glandular Physiology and Therapy. A Symposium Prepared Under the Auspices of the Council on Pharmacy and Chemistry of the American Medical Association. 528 pp. Chicago. American Medical Association. \$2.50.**

This is a reprint of the series of papers which appeared in the *Journal of the American Medical Association* last year. Usually such a compilation of multiple authorship is difficult to read and of uneven quality. This is remarkable in the uniform excellence and thoroughness of presentation. On account of the frequent references to the original literature, these summarizing chapters vary less in style even than such collections are wont to do. It is impossible adequately to review each chapter but the authoritativeness of presentation makes one recommend the book unhesitatingly as essential to every physician, as there is no field of the practice of medicine which has been left untouched by the recent advances in endocrinology.

**Diseases of the Liver, Gall Bladder, Ducts and Pancreas, Their Diagnosis and Treatment. Samuel Welss. 1099 pp. New York. Paul B. Hoeber Inc. \$10.00.**

It is possible that a consideration of diseases of the liver and biliary system demands a volume of almost 1100 pages. The first impression in reading this enormous compendium is amazement at the erudition of the author. There is no doubt that the book contains a tremendous amount of information as is evidenced by the fact that references alone cover over ninety pages of closely printed matter. It is probable that this reference list which covers a multitude of articles on all subjects germane to diseases of the biliary tract constitutes the greatest contribution to the book. The actual subject matter of the book however is beyond the scope of any reader except for purposes of reference and even here the material is frequently presented in a confusing and poorly correlated manner. The history, physiology, pathology and general discussion of diseases of the biliary tract is presented in amazing detail. The vast majority of the facts are correct but many of the details are presented with no criti-

cal thought and a rather careless arrangement. Certain important omissions can readily be noted. Altogether too much optimism and faith is put upon the diagnostic and therapeutic value of duodenal drainage. Therapeutic measures for various forms of liver diseases are complicated, too diversified and at times do little but confuse the reader. The consideration of such a common disease as catarrhal jaundice is poorly planned and does not take into account the more recent physiological and pathological findings in relation to the disease. Symptom complexes and clinical entities are intermingled in such a way as to leave the reader in doubt about given conditions, and contradictions and partial contradictions are frequent. Certain of the discussions, particularly the anatomic considerations of biliary tract disease, are excellent. The discussion of cirrhosis is on the whole fairly satisfactory but it is too complicated. Jaundice as a symptom is well described but poorly discussed. Treatment is based too much upon diversified methods more frequently seen on the Continent than in this country and not enough emphasis is placed upon direct methods indicated by clinical experience in given liver conditions.

There is practically nothing in the book that is simple and straightforward and no attempt has been made to clarify the conception of a sick liver. There seems to be an attempt to impress by completeness, although the book is far from complete. It represents a sort of mausoleum in which are buried all sorts of information and some misinformation. On the whole it does not form a real contribution to medical literature and it is to be regretted that the vast clinical experience of the author was not utilized as the basis of a much simpler volume, condensed into smaller space with a direct approach to many of the difficult problems connected with diseases of the biliary tract.

**Traité de Physiologie Normale et Pathologique. Published under the direction of G. H. Roger et Léon Binet. Tome X. Fascicule II. 3579 pp. Paris. Masson et Cie.**

With the tenth volume this treatise dealing with the normal and pathologic physiology of every system of the human body, is complete. The entire work is comparatively vast and comprehensive in scope and ably portrays the advanced state of French physiology. The last two books continue the format of those that have previously appeared and like their predecessors, completely cover the field dealt with. In addition to the presentation of the accepted phases of the physiology of the nervous system, there are included the results of much research. There are excellent chapters on the physiology of the skin by G. Millan, the physiology of hearing by A. Strohl, the sympathetic and parasympathetic systems by a number of contributors and the cerebrospinal fluid by J. Huguénau. The final volume is well conceived and excellently written and is highly recommended to the physiologist, the neurologist and the internist.

# The New England Journal of Medicine

VOLUME 215

AUGUST 20, 1936

NUMBER 8

## The Massachusetts Medical Society

### SECTION OF DERMATOLOGY AND SYPHILOLOGY

Municipal Auditorium, Springfield, Monday, June 8, 1936

#### PRESIDING

Dr Harvey P Towle Boston Chairman  
Dr Rudolph Jacoby, Boston Secretary

**CHAIRMAN TOWLE** The meeting will please come to order. The first business to come before it is the report of the Nominating Committee and the Election of Officers. May we hear from Dr Boardman, the Chairman of the Committee?

**DR. BOARDMAN** The Committee nominated as Chairman Dr C Morton Smith, and as Secretary, Dr J Harper Blaisdell.

**THE CHAIRMAN** You have heard the report of the Committee. What is your pleasure?

**A MEMBER** I move that the report of the Committee be accepted and that the Secretary cast one ballot for the Nomination and Election of Officers.

(The Secretary cast a ballot electing Dr C Morton Smith Chairman and Dr J Harper Blaisdell Secretary.)

**THE CHAIRMAN** Before I begin there is one thing I wish to say to you and that is we will have a round table discussion at luncheon at the Hotel Kimball following this session at approximately 12:45 if there are enough present to have one. I wish the men here who expect to attend would kindly raise their right hands.

(The Secretary recorded the members desiring to attend.)

**THE CHAIRMAN** The first paper on the program is by Dr Francis M Thurmon of Boston, on 'Bismuth Ethyl Camphorate. Clinical Observations on a New Oil Soluble Bismuth in the Treatment of Syphilis.'

### BISMUTH ETHYL CAMPHORATE\*

#### Clinical Observations On A New Oil Soluble Bismuth In The Treatment of Syphilis

BY FRANCIS M THURMON, M.D.†

OF the eighty-odd bismuth preparations that may be offered to physicians for use in the treatment of syphilis, there are two main classifications, namely, the soluble and the insoluble groups. Of the soluble group there are two types: the aqueous solutions and those that are soluble in oil. It is with the latter, an oil soluble bismuth, that this paper deals.

Clinical experience with the bismuth compounds points to the liposoluble preparations as being the best form of this metal for intramuscular injection at seven day intervals. This is because the oil soluble preparations possess an optimum rate of absorption and elimination and a superior ability to penetrate the tissues. On the basis of absorption and elimination alone the liposoluble preparations lie somewhere between the extremely motile aqueous solutions and the less motile bismuth suspensions.

From the Department of Dermatology and Syphilology and the Division of Research of The Boston Dispensary. The Bismuth Ethyl Camphorate used in this study was furnished by The Upjohn Company, Kalamazoo, Michigan. Read at the Annual Meeting of the Massachusetts Medical Society, Section of Dermatology and Syphilology, Springfield, June 8, 1936.

†Thurmon, Francis M.—Physician in Chief of the Clinic of Dermatology and Syphilology, The Boston Dispensary. For record and address of author see 'This Week's Issue,' page 362.

If a liposoluble bismuth possesses the properties of stability, treponemicidal effectiveness, resistance building qualities, adequacy from the standpoint of serologic response, and manifests a low degree of toxicity when other drugs are not tolerated, then that bismuth should be given careful consideration. The following data represent an eighteen months' study of such a liposoluble compound. This study, then, is a clinical evaluation of a new bismuth synthetic, bismuth ethyl camphorate, which was submitted for clinical testing in August, 1934.

Bismuth ethyl camphorate is a new oil soluble salt of bismuth. It is a pure organic compound made by the interaction of ethyl sodium camphorate and bismuth nitrate. Upon analysis the bismuth content agrees with the theory required by the formula  $C_{26}H_{57}O_{12}Bi$  (23.47 per cent Bi). It melts at  $57^{\circ}C$  and is soluble in oil and oil solvents.

Acute toxicity experiments using albino rats show the drug to be tolerated intramuscularly in doses somewhat larger than 250 mg of metallic bismuth per kilogram rat. All of the rats at the 250 mg dosage survived, while those receiving 400 mg per kil-



ogram did not survive. These results compare favorably with other oil soluble bismuths that have been described for use in the treatment of syphilis in man.

As this drug had not heretofore been used in the human subject, the study was planned for a small group of patients who could be under careful clinical observation and on whom a comprehensive laboratory study might be made. The preliminary period of observation showed that bismuth ethyl camphorate possessed special properties which appeared to justify a more extensive study of the drug. Consequently the investigation has extended over the past eighteen months and includes 230 patients who have received 2,444 intramuscular injections.

#### CLINICAL MATERIAL

From a clinic with approximately 1600 syphilitics under active treatment a series of 230 unselected cases were treated without regard to the stage of the disease. They included nineteen patients with primary, thirty-six with secondary, ninety-one with tertiary asymptomatic, sixty-three with tertiary symptomatic, and twenty-one with congenital syphilis. There were 146 males and eighty-four females. Fourteen were pregnant. Their ages ranged from four to seventy-three years. The decade containing the largest group was the thirty to forty year period (sixty-six patients), while seventy-four per cent of the entire group (171 cases) fell within the twenty to fifty year period.

The tertiary symptomatic group contained sixty-three patients. The incidence and type of syphilis presented by this group were as follows: skin and mucosal, six; bone, four; gumma of thyroid, nasopharynx, sternoclavicular articulation, penis, one case of each; neurosyphilis, thirty-three (tabes, nineteen; paresis five; tabo paresis, two; meningeal, seven); cardiovascular aortitis early, seven; aortitis with hypertension, seven; aortic insufficiency, eight; aortic aneurysm, four; syphilitic heart disease, six\*, eye, twenty.

There were twenty one patients with congenital syphilis. Of these, two were pregnant, five had an old interstitial keratitis, one an acute interstitial keratitis, one an old chorioretinitis and gumma of the jaw, and one, a female, aged twenty-six years, had an aortic insufficiency and neurosyphilis.

The primary, secondary and tertiary asymptomatic groups were of the usual run of patients for each of these entities.

During the course of treatment, routine ophthalmoscopic and visual field examinations were made. Each patient had frequent chemical and

microscopic studies of the urine. Occasional phenolsulphonphthalein excretion tests, and determinations of the nonprotein nitrogen and urea content of the blood, were carried out. Complete blood counts, icteric index and Fouchet tests were made in numerous instances. In these tests no significant variations from the normal were observed which might be attributed to bismuth ethyl camphorate.

#### TECHNIC OF ADMINISTRATION

Bismuth ethyl camphorate is administered in 1 cc doses intramuscularly. The drug is a stable, clear, oily solution, each cubic centimeter containing benzyl alcohol 0.02 gm, elemental bismuth 0.04 gm, and camphor 0.10 gm., in sweet almond oil. The inner angle of the upper outer quadrant of the buttock is the preferred site of injection. Treatments are alternated between the two buttocks.

The patients best tolerated the 1 cc dose. Higher dosage of 1.5 cc and 2 cc was well tolerated by some patients, while others manifested local pain, gingivitis, occasionally a mild dermatitis and seldom evidence of a transient renal irritation.

Infants and young children permitted larger amounts in proportion to body weight than did adults. The ratio of a 10 mg dose for infants up to twenty-five pounds seemed to be the optimum amount for that weight. Heavier children easily permitted a 20 mg to 30 mg dose, while those beyond eighty pounds body weight were treated with the adult dosage, attention being given to the urine and gums.

A course of heavy metal therapy in this clinic constitutes twelve injections. The fifty-five patients with primary and secondary syphilis received arsphenamine previous to the administration of bismuth ethyl camphorate as there seemed to be no justification for starting them on bismuth.

Clinic routine for treating early syphilis calls for immediate administration of arsphenamine, each patient receiving three injections a week for the first two weeks, two injections a week for the second two weeks, and one injection a week for the succeeding two weeks so that at the end of the first six weeks of treatment each patient has received twelve intravenous injections of an arsenical preparation. Then, without an intervening rest period in intramuscular therapy is instituted, and in these cases each patient received an injection of bis-

\* Of the six patients with syphilitic heart disease there was one instance of myocarditis with bundle branch block, three with cardiac decompensation and two with cardiac hypertrophy.

Arsphenamine therapy as applied here denotes the following. Clinic routine calls for the use of arsphenamine in all cases whenever possible. The adult dose ranges from 6 gm to 0.4 gm rarely going above the latter figure. Should untoward reactions to arsphenamine occur then neosalvarsan is employed the dose being 0.3 gm to 0.6 gm. Should untoward reactions to the latter occur then silver arsphenamine becomes the drug of choice the dose ranging from 0.1 gm to 0.3 gm. Through the past ten months the drug mapharsen has been added to this routine since it has been found that many patients will tolerate mapharsen when toxic reactions to the above arsenicals have occurred.

muth ethyl camphorate at seven day intervals for a total of twelve injections. This is considered to constitute one course of treatment. Regardless of the patient's serologic reactions and provided the clinical progress has remained uneventful, treatment is continued until two additional courses have been administered. With regular attendance this period of continuous medication covers the first sixty-six weeks of observation during which time the patient has received thirty-six injections each of an arsenical preparation and of bismuth, which in this instance was bismuth ethyl camphorate. These seventy-two injections are considered to be the minimum therapy any patient with primary or secondary syphilis should receive.

The remaining patients in this series (175) comprised the asymptomatic congenital and tertiary symptomatic groups. Exclusive of neurosyphilis, they received bismuth ethyl camphorate in blocks of twelve injections alternating with twelve injections of one of the arsenical preparations, each treatment being administered at seven-day intervals. Patients with neurosyphilis were usually treated with tryparsamid with an occasional substitution of metallothiopyron and one of the arsphenamines as mixed treatment.

The state of their physical condition, exclusive of sensitivity to bismuth formed no contraindication to the recommended dosage of 1 cc. A few instances of recurrent syphilis with resistant lesions required intensive medication. In these instances bismuth ethyl camphorate was administered twice each week, an arsenical drug every third day, and mercury and potassium iodide by mouth over periods of two to four weeks if necessary. This was accomplished without undue toxic effect and with a resulting involution of the recurrent lesions.

Occasionally prolonged treatment with one drug was necessary because of sensitivity to other preparations. For this reason twenty-one patients received from fifteen to twenty consecutive injections and another group of fifteen patients received from twenty to twenty-five injections respectively of bismuth ethyl camphorate without toxic effect. One patient, a male aged twenty years sensitive to all arsenicals developed an acute interstitial keratitis for which he received twenty-nine consecutive injections of bismuth ethyl camphorate (40 mg each) without toxic effect and with a clearing of the eye situation in six weeks.

With respect to prolonged treatment using the same drug it is believed that with bismuth ethyl camphorate as with all heavy metals and all arsenicals it is not advisable to continue treatment with the same drug too long lest that drug lose its effectiveness. This is amply illustrated in clinic practice where serorelapses,

recurrent mucocutaneous eruptions and the development of tertiary lesions occur altogether too frequently where a single one of these preparations is used to the exclusion of all others.

Bismuth ethyl camphorate has proved to be a valuable drug in the serofast or seroresistant group of cases since many of these patients show negative blood tests after its use whereas previously for years the serology\* had remained persistently positive. However, it is important to remember that continued mixed treatment is of the greatest value in order to hold the serologic ground gained, lest the change from positive to negative be only temporary. This observation applies to all forms of chemotherapy for syphilis.

#### RESULTS

*Pregnancy*—There were fourteen cases of pregnancy which were distributed as follows: congenital, two, secondary five, tertiary asymptomatic five, and tertiary symptomatic, two. In each of these instances it was possible to administer treatment through the last five months of pregnancy. They received regular treatment at seven-day intervals up to term, starting with a twelve injection course of bismuth ethyl camphorate which was followed by arsphenamine intravenously. The bismuth ethyl camphorate was received without ill effect. Each patient produced a full-term child with no stigmata of congenital syphilis. Certain laboratory studies on the infants were completed within the first three months following birth. They revealed negative Hinton, Wassermann and Kahn reactions on the blood and x-rays of the long bones were normal. Although this period of observation is too short to evaluate fully the effect of this treatment upon the offspring of patients with syphilis it may be said with certainty that there were no demonstrable toxic effects from the drug upon either the mother or fetus and each of the pregnancies went to full term.

*Serology*—The serologic results are summarized in table 1. The effect of bismuth ethyl camphorate in producing a serologic change is perhaps one of the strongest points for its use. Of the 180 patients on whom serologic data were available at the beginning and end of bismuth ethyl camphorate therapy, the Hinton, Wassermann and Kahn reactions remained negative in twenty-five instances throughout the period of observation. Not only does this new oil soluble preparation seem to hold the serologic ground gained by other methods of treatment but in addition with its routine use as outlined a serologic change was produced in fifty per cent of the remaining 155 cases.

\*The term serology as used in this paper denotes the routine use of the standard tests for the Hinton, Wassermann and Kahn reactions.

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The tertiary manifestations were usually those of a serious nature. Of the visible type sixteen patients with optic atrophy ranging from slight pallor of the nerve head to complete atrophy in one or both optic nerves were of interest. Often during treatment with the arsphenamines these patients rapidly lose their visual acuity and progress to complete blindness unless carefully controlled. We have yet to see this occur under intramuscular bismuth or mercury therapy alone. It did not occur in the sixteen cases cited here. Each patient tolerated bismuth ethyl camphorate well. In eight of the sixteen where pallor of the optic nerve was slight there was no change noted in the visual fields, but there was measurable improvement in visual acuity.

A single instance of papilledema due to syphilis was treated with bismuth ethyl camphorate

interesting problem case of bone and cutaneous manifestations. She entered with secondary syphilis. Nitritoid crises were experienced under arsphenamine, neoarsphenamine and bismarsen. A toxic hepatitis with icterus was precipitated by arsphenamine. Headaches, dizziness and loss of consciousness followed bismuth salicylate on two occasions. A secondary mucocutaneous relapse occurred during mercury succinimide therapy, the rash involuting under small doses of silver arsphenamine. Yet no sooner had the recurrent lesions disappeared when hydrarthrosis of both knees, osteomyelitis of the right tibia, and ulcerative lesions of each leg developed. Potassium iodide produced an iodide eruption. Twelve injections of bismuth ethyl camphorate (40 mg to 60 mg each) administered at three-day intervals were well tolerated. The edema, pain and redness of

TABLE 2  
SEROLOGIC CHANGE FOLLOWING THE USE OF BISMUTH ETHYL CAMPHORATE  
IN ELEVEN PATIENTS WITH SYPHILIS

Test	Cases	Serologic Change	Type of Syphilis
Hinton	One	Negative to Positive	Tabes dorsalis and optic atrophy
Hinton	One	Negative to Positive	Recurrent secondary syphilis
Hinton	One	Doubtful to Positive	Paresis
Hinton	One	Doubtful to Positive	Asymptomatic syphilis
Wassermann	One	Doubtful to Positive	Tabes dorsalis
Wassermann	One	Negative to Doubtful	Aortitis
Kahn	One	Negative to Positive	Paresis
Kahn	One	Doubtful to Positive	Aortitis
Kahn	One	Doubtful to Positive	Charcot's knees
Kahn	One	Negative to Doubtful	Congenital
Kahn	One	Negative to Doubtful	Asymptomatic syphilis

This patient, a male, aged 36, had neurosyphilis. His vision was restored to normal through use of the new liposoluble bismuth administered at seven-day intervals. Later he proved to be in tolerant to the arsphenamines. Nitritoid crises were caused by neoarsphenamine and arsphenamine precipitated a toxic hepatitis with icterus. Bismuth ethyl camphorate was tolerated very well.

One patient, a female, aged 58, entered with an ulcerative lesion involving the thyroid gland. There was healing and scarring in some parts of the involved area while other portions showed destructive ulceration. The entire process seemed matted together and bound down into a single immovable unit. Portions of the thyroid gland were firm and hard. Biopsy was refused. The Hinton, Kahn and Wassermann reactions were repeatedly positive. Six injections of bismuth ethyl camphorate (40 mg each) at seven-day intervals produced practically complete involution of the lesion. The case could not be followed to completion, since, for social reasons, she was transferred to another clinic. Follow-up there indicated total healing of the area within the next few weeks.

Patient A. R., a female, aged 43, was an in-

the knees subsided the cutaneous lesions healed, but the draining sinus of the osteomyelitis continued to discharge. It was only after the patient received ten fever treatments in the Kettering Hypertherm consisting of 28 hours of fever between 105° and 106° and 6 hours between 104° and 105°, that the osteomyelitis cleared. After the first three treatments there was distinct improvement in the bone lesion as evidenced by x-ray. Further examination after five treatments showed denser bone in the region of the lesion and after the complete series of treatments the bone condition remained cleared and the patient felt well and healthy again.

Patient No. 350239, a female, aged 46, entered with "myocarditis" and a gumma of the right leg. Twenty-four consecutive injections (40 mg each) of bismuth ethyl camphorate were administered at seven-day intervals. The gumma healed in four weeks. There were no toxic manifestations and the urine remained normal throughout treatment.

Patient No. 153940, a male, aged 58 with tabes dorsalis developed a gumma of the left testicle while undergoing treatment with tryparsamid. Twelve injections of bismuth ethyl

TABLE 1  
SEROLOGIC CHANGES NOTED FOLLOWING THE USE OF BISMUTH ETHYL CAMPHORATE IN THE ROUTINE TREATMENT  
OF 180 PATIENTS WITH SYPHILIS\*

Stage of Syphilis	Number of Cases	Serology Completely Negative Throughout Cases Per Cent	Hinton				Serologic Changes Wassermann				Kahn			
			Pos		Dbt		Pos		Pos		Pos		Dbt	
			to Neg	Cent	to Neg	Cent	to Neg	Cent	to Neg	Cent	to Neg	Cent	to Neg	Cent
Primary	19	68.4	6	31.6	0	0	0	0	5	26.3	0	0	0	0
Secondary	31	12.9	6	19.3	2	6.4	4	12.9	11	35.4	0	0	0	0
Tertiary	65	4.6	9	13.8	2	3	5	7.6	6	9	1	1.5	3	4.6
Asymptomatic														
Tertiary	52	7.7	7	5.7	1	1.9	1	1.9	4	7.7	2	3.8	0	0
Symptomatic	13	7.7	1	7.7	0	0	0	0	0	0	1	7.7	1	7.7
Congenital														

\* Additional data bearing on these serologic changes are appended in table 2

In the group of 180 patients on whom complete serologic data were obtained, the Hinton test was persistently negative in twenty six, the Kahn in fifty-four and the Wassermann in ninety-four cases respectively. Thus, to say the least, is illustrative of the comparative degree of sensitivity of these three tests as performed in the laboratory of The Boston Dispensary.

The reversal of positive and doubtful serologic reactions to negative is of considerable significance, especially as it relates to the Hinton reaction. It is the experience of this clinic that the Hinton reaction is more difficult to render negative than either the Kahn or Wassermann. The degree with which this was accomplished is illustrated in table 1. The changes from positive to negative were essentially the same in all three tests.

The reversal of negative or doubtful serology to positive is also of some significance. The eleven instances where this occurred in this series are appended in table 2. They are strongly suggestive of a possible provocative use of the drug.

#### EFFECT UPON VISIBLE LESIONS

An evaluation of the effectiveness of bismuth ethyl camphorate in the treatment of early syphilis was necessarily incomplete because of the clinic policy of starting these patients on one of the arsphenamines. In only one instance was there an opportunity to observe, even partially, the effect of the drug in primary syphilis. In this case, following the second injection of the arsenical used, the patient experienced a severe prolonged reaction characterized by nausea, vomiting, anorexia, dermatitis, fever and jaundice. The penile lesion was of a deep ulcerative type that had barely begun to involute. Bismuth ethyl camphorate (40 mg doses) was administered at three day intervals. Within ten days the toxic manifestations had disappeared and at the end of fourteen days the healing of the ulcerative defect and involution of the infiltrate was accomplished. Later an arsenical preparation again precipitated toxic reactions.

There were four clinical relapses as shown by the recurrence of cutaneous or mucosal lesions, due either to irregular and insufficient treatment or occurring during bismuth salicylate therapy. These recurrent lesions involuted rapidly under bismuth ethyl camphorate therapy (40 mg dose) at four day intervals, and completely disappeared by the time of the fourth injection.

An acute interstitial keratitis was brought under control following the sixth injection of bismuth ethyl camphorate when the recommended 40 mg dose at seven day intervals was used.

The tertiary manifestations were usually those of a serious nature. Of the visible type sixteen patients with optic atrophy ranging from slight pallor of the nerve head to complete atrophy in one or both optic nerves were of interest. Often during treatment with the arsphenamines these patients rapidly lose their visual acuity and progress to complete blindness unless carefully controlled. We have yet to see this occur under intramuscular bismuth or mercury therapy alone. It did not occur in the sixteen cases cited here. Each patient tolerated bismuth ethyl camphorate well. In eight of the sixteen where pallor of the optic nerve was slight there was no change noted in the visual fields, but there was measurable improvement in visual acuity.

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teresting problem case of bone and cutaneous manifestations. She entered with secondary syphilis. Nitritoid crises were experienced under arsphenamine, neoarsphenamine and bismarsen. A toxic hepatitis with icterus was precipitated by arsphenamine. Headaches, dizziness and loss of consciousness followed bismuth salicylate on two occasions. A secondary mucocutaneous relapse occurred during mercury succinimide therapy, the rash involuting under small doses of silver arsphenamine. Yet no sooner had the recurrent lesions disappeared when hydrarthrosis of both knees, osteomyelitis of the right tibia, and ulcerative lesions of each leg developed. Potassium iodide produced an iodide eruption. Twelve injections of bismuth ethyl camphorate (40 mg to 60 mg each) administered at three-day intervals were well tolerated. The edema, pain and redness of

the knees subsided, the cutaneous lesions healed, but the draining sinus of the osteomyelitis continued to discharge. It was only after the patient received ten fever treatments in the Kettering Hypertherm consisting of 28 hours of fever between 105° and 106° and 6 hours between 104° and 105°, that the osteomyelitis cleared. After the first three treatments there was distinct improvement in the bone lesion as evidenced by x-ray. Further examination after five treatments showed denser bone in the region of the lesion and after the complete series of treatments the bone condition remained cleared and the patient felt well and healthy again.

Patient No 350239, a female, aged 46, entered with "myocarditis" and a gumma of the right leg. Twenty-four consecutive injections (40 mg each) of bismuth ethyl camphorate were administered at seven-day intervals. The gumma healed in four weeks. There were no toxic manifestations and the urine remained normal throughout treatment.

Patient No 153940, a male, aged 58 with tabes dorsalis developed a gumma of the left testicle while undergoing treatment with try-

TABLE 1  
SEROLOGIC CHANGES NOTED FOLLOWING THE USE OF BISMUTH ETHYL CAMPHORATE IN THE ROUTINE TREATMENT  
OF 180 PATIENTS WITH SYPHILIS\*

Stage of Syphilis	Number of Cases	Serology Completely Negative Throughout Cases Per Cent	Hinton			Serologic Changes Wassermann			Kahn		
			Pos to Neg		Pos to Dbt Cases Per Cent	Pos to Neg		Pos to Dbt Cases Per Cent	Pos to Neg		Dbt to Neg Cases Per Cent
			Cases	Per Cent		Cases	Per Cent		Cases	Per Cent	
Primary	19	13	6	31.6	0	0	0	0	5	26.3	0
Secondary	31	4	6	19.3	2	6.4	4	12.9	11	35.4	0
Tertiary											
Asymptomatic	65	3	9	13.8	2	3	5	7.6	6	9	1
Tertiary											
Symptomatic	52	4	3	5.7	1	1.9	1	1.9	4	7.7	2
Congenital	13	1	1	7.7	0	0	0	0	0	0	0
									1	7.7	1

\*Additional data bearing on these serologic changes are appended in table 2

In the group of 180 patients on whom complete serologic data were obtained, the Hinton test was persistently negative in twenty six, the Kahn in fifty-four and the Wassermann in ninety-four cases respectively. Thus, to say the least, is illustrative of the comparative degree of sensitivity of these three tests as performed in the laboratory of The Boston Dispensary.

The reversal of positive and doubtful serologic reactions to negative is of considerable significance, especially as it relates to the Hinton reaction. It is the experience of this clinic that the Hinton reaction is more difficult to render negative than either the Kahn or Wassermann. The degree with which this was accomplished is illustrated in table 1. The changes from positive to negative were essentially the same in all three tests.

The reversal of negative or doubtful serology to positive is also of some significance. The eleven instances where this occurred in this series are appended in table 2. They are strongly suggestive of a possible provocative use of the drug.

#### EFFECT UPON VISIBLE LESIONS

An evaluation of the effectiveness of bismuth ethyl camphorate in the treatment of early syphilis was necessarily incomplete because of the clinic policy of starting these patients on one of the arsphenamines. In only one instance was there an opportunity to observe, even partially, the effect of the drug in primary syphilis. In this case, following the second injection of the arsenical used, the patient experienced a severe prolonged reaction characterized by nausea, vomiting, anorexia, dermatitis, fever and jaundice. The penile lesion was of a deep ulcerative type that had barely begun to involute. Bismuth ethyl camphorate (40 mg doses) was administered at three day intervals. Within ten days the toxic manifestations had disappeared and at the end of fourteen days the healing of the ulcerative defect and involution of the infiltrate was accomplished. Later an arsenical preparation again precipitated toxic reactions.

There were four clinical relapses as shown by the recurrence of cutaneous or mucosal lesions, due either to irregular and insufficient treatment or occurring during bismuth salicylate therapy. These recurrent lesions involuted rapidly under bismuth ethyl camphorate therapy (40 mg dose) at four-day intervals, and completely disappeared by the time of the fourth injection.

An acute interstitial keratitis was brought under control following the sixth injection of bismuth ethyl camphorate when the recommended 40 mg dose at seven day intervals was used.



of toxicity is perhaps expressed by the great number of instances where bismuth ethyl camphorate could be used with comfort and safety when other preparations caused toxic or ill effects. There were sixteen instances where bismuth salicylate was discontinued because of local or systemic reaction. Mercury succinimide caused folliculo papular eruption or abdominal cramps and diarrhea in four cases. Bismarsen precipitated nitritoid crises in five of the patients. Iodo-bismuthate of quinine accentuated general aches and pains in two cases and had to be discontinued. In each of these instances bismuth ethyl camphorate was well tolerated when the dose was kept within the recommended therapeutic range.

In this connection patient, B D No 340878, a female aged 29 with secondary syphilis is interesting. Under arsphenamine she developed a dermatitis. Bismuth salicylate caused severe aching pains and edema in the hands and arms. Under mercury succinimide a hepatitis with icterus occurred. The liver was palpable three fingers below the costal margin and the gums were spongy, blue and showed a sanguineous ooze. A terrific nitritoid reaction to sodium thiosulphate occurred. During this distressing period she was started on bismuth ethyl camphorate and tolerated it very well receiving twelve doses without untoward effect, though she did complain of mild itching following the eighth injection. As there was no rash or dermatographia treatment was continued with a resulting disappearance of the toxic and syphilitic manifestations.

In the series of 230 patients many of them manifested toxic reactions of various types to the arsenical preparations. Of these untoward manifestations forty-nine patients experienced nitritoid crises to one or more of the arsphenamines including bismarsen. There were eleven instances of hepatitis with icterus, nine of dermatitis, and two of toxic ocular reactions including neuroretinitis\*. During the acute stage of each of these toxic manifestations the offending arsenical was withdrawn and treatment for syphilis was carried on with bismuth ethyl camphorate for a period of three to five months. The toxic manifestations disappeared and clinical progress continued uneventful under the new oil soluble preparation. In this respect bismuth ethyl camphorate is no different than other of the standard bismuth preparations.

#### ABSORPTION AND ELIMINATION

As this problem was a clinical evaluation of a new oil soluble bismuth no special studies were directed toward absorption and elimination. However judging from the therapeutic effect

tiveness of the drug as measured by the clearing of visible cutaneous lesions of recurrent and late syphilis, serologic reversals, the relief of precordial and vague "rheumatic" tertiary pains, the restoration of a more forceful myocardium after cardiac failure and the occasional instance of bismuth deposit in the gingival margins or the taste of camphor following injection, it seems safe to assume that the drug was absorbed and therapeutically active.

In a few cases where x-ray examination of the injected areas was done as recently as six weeks after the last injection of a series of twelve intramuscular treatments at seven-day intervals, the films showed no shadow of bismuth retention.

#### SUMMARY AND CONCLUSION

Bismuth ethyl camphorate, a new oil soluble bismuth is described. The dose, technic of administration and results obtained in the treatment of 230 patients (244 injections) are presented. The clinical material from which the data are derived consisted of fifty-five cases of early syphilis, twenty-one congenital sixt-three with tertiary symptomatic and ninety-one in the latent or asymptomatic stage of the disease. There were fourteen cases of pregnancy.

Each cubic centimeter of bismuth ethyl camphorate contains 40 mg of elemental bismuth. This amount constitutes the recommended dose which routinely is administered at seven-day intervals but should intensive treatment be desired the intervals may be shortened to three days.

The results as herein presented indicate that bismuth ethyl camphorate despite its low bismuth content is an extremely valuable drug in the treatment of syphilis. It is a safe drug to use. Therapeutically, it is at least equal and in many respects superior to other preparations in the heavy metal series.

Bismuth ethyl camphorate is an exceedingly valuable adjunct to the arsphenamines in the treatment of early syphilis. Used in doses within the therapeutic range it is of very low toxicity. The number of serologic reversals, the rapid clearing of visible lesions and the ability of patients to tolerate the drug when other preparations are ill tolerated, bespeak its usefulness.

Bismuth ethyl camphorate is well borne by children and in pregnancy. The absence of therapeutic shock and paradoxical effects in vital structures make it a valuable preparation in the treatment of cardiovascular syphilis and in the toxic ocular, hepatic and cutaneous reactions. In neurosyphilis so far as this small series goes, it is a valuable adjunct as mixed therapy for interrupting the continuous use of tryparsamid.

\* Identical with that described by Skirball, J. J. and Thurmon, F. M. Ocular reactions due to arsphenamine. report of 20 cases. *Am J Syph & Neurol* 19:197 (April) 1925.

camphorate were administered and the gumma disappeared after the eighth injection

A twenty-two year old male with secondary syphilis developed an ulcerative scrotal lesion that resisted intensive arsenical and heavy metal therapy. The lesion cleared after six injections of the new liposoluble preparation

Patient No 345843, a male, aged 28, had tertiary cutaneous syphilis with skin lesions over the trunk resembling dermatitis herpetiformis and ulcerations on the legs. These areas cleared after the sixth treatment with the new drug

There were numerous instances of the types indicated above where visible lesions of syphilis were of concurrent appearance with more serious manifestations of the disease. The progressive manner in which the new oil soluble bismuth caused these lesions to disappear seemed to leave no question of doubt as to the therapeutic effectiveness of the drug

#### TOXICITY

The toxic effects of bismuth ethyl camphorate are summarized in table 3. They are compared with the untoward effects produced by bismuth salicylate, a standard insoluble bismuth salt suspended in oil. The 180 patients of the bismuth salicylate series were regular clinic cases under routine treatment. The comparison shows the liposoluble bismuth in a favorable light

TABLE 3

TOXIC EFFECTS NOTED IN USE OF BISMUTH ETHYL CAMPHORATE AND BISMUTH SALICYLATE IN TREATMENT OF SYPHILIS

Signs and Symptoms	Bismuth Ethyl Camphorate	Bismuth Salicylate
	230 Cases	180 Cases
Local Pain	20	30
Leg Pain	1	1
Generalized Aches and Pains		4
Bitter Taste—Aching Gums	2	1
Metallic Deposit in Gums	2	12
Headache Sore Throat		4
Gastro-Intestinal*	1	5
Nitritoid Crises†	1	1
Dermatitis‡	2	1
Jaundice		1

\*Nausea vomiting diarrhea cramps

†Patient stated following the third and fourth injections of bismuth ethyl camphorate that chills and fever occurred. Bismuth salicylate was tolerated very well. Following the fourth injection of bismuth salicylate chills and fever occurred later jaundice appeared and the liver was palpable. Bismuth ethyl camphorate was started while the liver was still palpable jaundice visible icteric index .0 and these signs cleared

‡With bismuth ethyl camphorate the dermatitis was a transient erythematous eruption of face and neck while that caused by bismuth salicylate was a millary folliculo papular eruption of trunk and extremities

**Local Irritation**—The local tissue reaction is generally mild. In only eight instances out of 230 cases was it necessary to transfer the patient to some other form of treatment for this cause. Approximately ten per cent of the

patients complained of local stiffness or soreness lasting from ten to twenty-four hours and rarely for more than forty-eight hours after injection. Usually after the initial two or three injections no further pain was noted. No demonstrable local inflammatory changes and no abscess formation occurred in 2444 injections

**Systemic Reactions**—The new drug has a low toxicity from the general systemic point of view. Albuminuria or other evidence of renal irritation such as casts and red blood cells were observed in only two instances\*. One patient, a male, aged 28, with tabes dorsalis and optic atrophy showed the faintest possible trace of albumin and an occasional cast following the ninth injection of bismuth ethyl camphorate. The other patient, a male, aged 52, with cardiovascular syphilis and hypertension showed a few hyaline casts, an occasional red blood cell and a rare white blood cell but no albumin, following the thirteenth injection of bismuth ethyl camphorate. These changes were of temporary significance for in each instance the urine cleared within three weeks after discontinuing the heavy metal. In the remaining 228 patients the urine (684 analyses) remained normal throughout

In none of the patients was there evidence of liver damage, stomatitis or reactions suggesting anemia or aleukemia hemorrhagica. With exception of two patients who showed a transient conjunctival hyperemia there were no toxic ocular manifestations. Treatment in these two patients was continued. In all cases where dental hygiene was good there was no evidence of bismuth deposit at the gingival margins. An occasional patient would notice a taste of camphor shortly after treatment but this effect was transient not an objectionable feature and lasted only a few moments. The single recorded instance of nitritoid crisis is of difficult evaluation. It is based entirely upon the patient's statement, namely, that a few hours after the third and fourth injections of bismuth ethyl camphorate she had chills and fever which incapacitated her for the remainder of the day of treatment

During the early period of the study when larger amounts (60 mg to 80 mg) than the recommended dose (40 mg) were used, the drug did seem to possess potential possibilities of toxicity that is to say, the untoward effects noted in table 3 were slightly magnified yet in direct proportion to the larger dose the therapeutic effectiveness seemed to be increased as was noted in serologic reversals and the rapid clearing of visible tertiary lesions

**Lack of Toxicity**—The best measure of a lack

Routine urinalyses were done at the beginning middle and end of each course of twelve injections of bismuth ethyl camphorate and at the beginning and end of each block of intravenous therapy

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## DISCUSSION

THE CHAIRMAN This paper is now open to discussion

DR CHARLES C DENNIE, Kansas City, Missouri I have had no experience with this type of blight which has just been reported, but I was extremely interested in the results that have been secured especially in some of the cases of relapses, and in relapses from other types of therapy. It has always been my opinion that any time where we have relapses either going into the treatment or shortly after the cessation of treatment the patient voluntarily using the treatment, that the relapses have been due to a lack of response upon the part of the patient. In other words, it must go hand in hand with the active treatment, and we have been able to show by our experience that that is true. In the case of neuro relapses especially does that

occur under active treatment and we are enabled to cause disturbance of these lesions by stimulating motivity of the patient, and that may be done in several ways. We have also noted then with reference to lesions disappearing, as they do in a large majority of cases that if those patients are left alone those lesions will make their appearance again, in fact sometimes more severely than they did originally. We have found that after a few days course of hyperpyrexia or whatever you may have, that same type of treatment that was used without success before the introduction of hyperpyrexia responds rapidly and so far as we know permanently.

THE CHAIRMAN Are there any others who wish to speak on this subject? If not we will pass to the next paper, which is 'Mycoses Fungus Diseases of the Skin and Internal Organs' by Dr J H Swartz Massachusetts General Hospital, Boston

## THE ROLE OF FUNGI IN MEDICINE\*

BY J H SWARTZ, M D †

MYCOLOGY is no longer a mysterious subject known only to few. It has been proved to be a part of medicine just as bacteriology, physiology, and so forth. Some knowledge of mycology is necessary for a better understanding of disease.

In this paper an attempt will be made to discuss the elements of mycology and its application not only to dermatology but to medicine in general.

The subject of mycology to many conveys the idea that it applies to only one disease, namely "athlete's foot." The so called athlete's foot, which by the way is a misnomer, represents only one condition that can be caused by fungi.

To make this paper more explicit an attempt will be made to divide it as follows:

- 1 History
- 2 Classification of fungi
- 3 Diagnosis
- 4 Allergy and fungi
- 5 Hematogenous dissemination of the dermatophytes
- 6 Occupational dermatoses and fungi
- 7 Fungi and internal medicine
- 8 Treatment

Time and space will not permit giving a historical account of pathogenic fungi. Furthermore, I do not believe it is necessary, since many papers on this subject have already been published. Reference can be made to Dr Greenwood's excellent paper read before this section last year. However, a few remarks are appropriate.

**History**—The history of mycology dates back to the reign of Charles II when Hook, with a lens of his own making, carefully examined the

blight of the damask rose, and illustrated his findings. Up to the latter part of the eighteenth century, progress was slow. The men of that time who made important investigations were Malpighi, Ray, Micheli, Linnaeus, Lightfoot, Pelham, Butsch, Bulliard, and others.

From 1800 progress has been much more rapid, but it was not until Ramak in 1837, discovered the parasitic fungi in ringworm that particular attention was paid to the microfungi as possible factors in the causation of human ills.

One hundred and three years ago Schoenlein discovered that favus, at that time named porigo lupinosa, was caused by a fungus. For the first time the concept of exogenous parasitic genesis of human disease was elevated to clear reality from the realm of mystic speculations. From 1841 to 1844 Gruby described the etiologic agent of thrush, of favus (independently of Schoenlein), of sycoosis barbae, parastaria, and of trichophytosis. He differentiated the various fungi, recognized their etiologic relationship with definite diseases and evaluated the importance of his discoveries for the genesis and therapy of contagious diseases. The full importance of this will be appreciated when one realizes that these dermatoses were at that time classed as manifestations of diabetic or hereditary diseases. In 1890, fifty seven years later, Sabouraud applied the methods of Koch and Pasteur to the field of dermatomycoses. He further attempted pure cultivation of mycologic species, recognition of their plurality and specificity and co-ordination of the specific relationship between the clinical picture and the species of the fungi. Later Bloch and Jadassohn and their students developed the biologic phase of dermatomycoses. This work is still being done today. More will be said about this phase in the discussion of allergy and fungi.

\*Read at the Annual Meeting of the Massachusetts Medical Society, Section of Dermatology and Syphilology, Springfield, June 5, 1935.

†Swartz J H—Assistant Dermatologist, Massachusetts General Hospital. For record and address of author see This Week's Issue, page 362.

*Classification of Fungi*—No attempt will be made to give a strict botanical classification first because it is not practical for our purpose, secondly, because the classification is still chaotic and thirdly because I am not a botanist. However, an attempt will be made to give a practical and useful classification with apologies to the botanist for not adhering strictly to botanical rules.

Fungi may be divided into two large divisions

- I Myxomycetes (vegetative body under form of a multinucleated, naked plasmodium)
- II Eumycetes (vegetative body usually filamentous)

The fungi pathogenic to man usually belong to Class II which may be further subdivided as follows

- 1 Phycomycetes The pathogenic species reproduced by zygospores. The mycelium is multinucleate and often nonseptate
- 2 Basidiomycetes Reproduction is by means of basidiospores. The mycelium is septate, and either binucleate or uninucleate
- 3 Ascomycetes Reproduction by means of ascospores. The mycelium is septate when present and usually 2-5 nucleate in pathogenic species
- 4 Hyphomycetes or fungi imperfecti Reproduction is by free-borne spores (conidia) that are never contained in an ascus. The mycelium is septate, and usually uninucleate. Sexual reproduction absent or unknown (whence the name imperfecti)

Most fungi pathogenic to man belong to either the ascomycetes or hyphomycetes which, from a clinical standpoint, can be further subdivided into

- a yeasts and yeast-like organisms (endomycetales)
  - (1) saccharomycetes (true yeasts)
  - (2) cryptococcus
  - (3) monilia
  - (4) endomycetes
  - (5) coccidioides
- b Ringworm fungi (Gymnoasceae)
  - (1) microsporon (Lanosum [animal])  
(Audouini [human])
  - (2) achorion (Quinckeanum)  
(Schoenleini)
  - (3) trichophyton
    - ectotrichophyton, e.g., T. gypsum
    - megatrichophyton T. rosaceum
    - favotrichophyton T. ochraceum T. violaceum

eutrichophyton  
neoendothrix T. cerebriform  
endothrix T. ciateriorme T.  
acuminatum

#### (4) epidermophyton

The organisms which cause sporotrichosis and actinomycosis belong to the family of fungi imperfecti

*Diagnosis*—The diagnosis of fungus infection whether it be of the skin or any other organ is not simple. It must be remembered that the finding of a fungus particularly a yeast-like organism, in the material examined does not always mean that the organism found is the causative agent of the pathology in question. One must bear in mind the fact that the organism may be found either under normal conditions or as a secondary invader, for example, the finding of a yeast-like organism in the sputum, stools, or even on the skin. Before considering it a pathogen in the case in question its pathogenicity by animal experimentation, and so forth, must be established.

A diagnosis of fungus infection of the skin is made by (1) clinical findings, (2) direct microscopic examination and (3) by cultural studies. It may be well at this point to discuss the method of direct microscopic examination of the skin.

The most common procedure is to use a clearing agent such as potassium hydrate, xylol chloral hydrate, or glycerine, to permit a microscopic examination of the skin scales. Of these, potassium hydrate is the most commonly used and is by far the most effective. However, because of the artefacts such as crystals, fat globules, and the mosaic fungus the examiner has to use an unusual degree of caution to avoid errors in interpretation of microscopic findings. The author therefore recommends the following technique of Swartz and Conant<sup>2</sup> which eliminates many of the artefacts. After the preliminary treatment of the scales with 10 per cent potassium hydroxide they are transferred to a watch crystal and washed with water. When the action of the potassium hydroxide is stopped, in two or three minutes, the bits of scales are gently heated in a drop of lactophenol cotton blue and a cover glass pressed on to the preparation. The clearing action of the potassium hydroxide is continued by the lactophenol and the epidermal cells receive a light bluish stain while the granular protoplasmic content of the fungus is heavily stained. In the case of thick scales or nail material a 1 per cent solution of cotton blue in 70 per cent alcohol is used, and the material is then mounted in clear lactophenol cotton blue. This method is valuable not only in the case of distinct well-defined fungus hyphae, differen-

tiating them better than potassium hydroxide alone, but it is especially advantageous in cases where yeast-like budding cells appear in preparations. In such cases the use of potassium hydroxide alone requires the greatest of caution, for many times fat globules also assume such forms and a positive diagnosis must be given with reservations. When, however, such preparations are stained with lactophenol cotton blue, after treatment with 10 per cent potassium hydroxide the scales are sufficiently cleared and the artefacts are not present while the stained budding yeast-like cells are easily recognized.

*Allergy and Fungi*—Under the topic of allergy and fungi we have to consider, (1) fungous infections of the skin and its appendages with a resulting eruption which does not show the presence of fungus on direct microscopic examination or on cultural studies. These eruptions are termed "ides." They may vary in type and may be found on the extremities or elsewhere. For example, the lichenoid eruption that may occur with kerion. Fever and constitutional symptoms have been reported.<sup>3</sup>

The first notice of generalized eruptions occurring in connection with focal mycotic infection was taken by Jadassohn, who, in the discussion of Bloch's paper on trichophytosis, described several cases of kerion, in which spiny lichenoid papules were scattered over the trunk. Since then numerous references on the subject have appeared in literature but time and space will permit only a brief mention. Particular reference is made to the excellent papers by Dr. Charles M. Williams.

Numerous reports are found in the literature on the scratch and intradermal tests to trichophyton and oidiumvein but the interpretation varies. However, a good working rule based upon the various findings may be said to be as follows. A positive scratch or intradermal test to trichophyton indicates either a present or past infection. One must remember that an infection in the past may still give a positive test although the present dermatologic condition is not at all related to the test. A negative test, however, is of much greater importance, since it frequently rules out the possibilities of infection. In other words, the trichophyton test is quite comparable to the tuberculin test. Sulzberger and Lewis<sup>4</sup> by means of contact or patch tests with trichophyton demonstrated that products of fungi are capable of causing an eczematous eruption on a hypersensitive skin. Sulzberger and Kerr<sup>5</sup> also recorded a case of a man with tinea of the hands and feet who gave immediate marked urticarial wheal reactions to intradermal trichophyton tests. With this patient's blood serum they were able passively to transfer the urticarial trichophyton hyper-sen-

sitiveness to the skin of normal nonsensitive individuals thus demonstrating the presence in the blood of Prausnitz Küstner antibodies of specific reagins. Wise and Sulzberger<sup>6</sup> reported the case of a patient with dermatitis and occasional attacks of urticaria asthmalia, and hay fever in whom an intradermal test with trichophyton produced an acute attack of hay fever and a generalized urticaria necessitating the administration of epinephrin for relief.

(2) Sensitization to the fungi found in the dust (house and mattress). Storm van Leeuwen<sup>7</sup> was the first to call attention to the importance of mold allergens in the causation of asthma. He attributed the climatic type of asthma so prevalent in Holland to products of the growth of molds, yeasts or bacteria which he termed "climate allergens or miasms." Storm van Leeuwen worked with six different molds, namely, *Aspergillus flavus*, *Aspergillus fumigatus*, *Aspergillus nidulans*, *Aspergillus niger*, *Mucor*, and *Penicillium*, and by testing his asthmatics intracutaneously with extracts of these molds, found about 50 per cent of them sensitive to mold allergens. Hansen,<sup>8</sup> in Germany found that 15 per cent of his asthmatic patients gave positive reactions to one or more of the following molds *Aspergillus fumigatus*, *Aspergillus niger*, *Penicillium glaucum*, and *Aspergillus nidulans*. He was able to reproduce asthmatic attacks in a number of these patients with spores of the reacting molds.

Hopkins, Benham, and Kesten<sup>9</sup> were the first in the United States to report a case of asthma due to a fungus (alternaria). The patient, in addition to being markedly sensitive to alternaria, gave definitely positive skin reactions to several other skin molds, including *Aspergillus nidulans* culture from an eczematous lesion on his leg. In this connection it may be stated that some years previously Niethel<sup>10</sup> and Hilgermann<sup>11</sup> had attributed certain cases of eczema to sensitization to common saprophytic molds which grew on the skin lesions.

In a group of fifty-five patients with chronic asthma, the majority of whom had no other positive reactions and eighteen of whom reacted to dust, Flood<sup>12</sup> found five who reacted to fungi by intradermal testing. Balyeat et al.<sup>13</sup> cultured the air in Oklahoma City and found only *Aspergillus* and *penicillia*. He tested 480 cases by the scratch and intradermal methods and found only four positive reactions. He therefore concluded that molds are of rare importance in allergy.

Jimenez Diaz et al.<sup>14</sup> made a mycological and clinical study in Spain and concluded that many of the true cases of climatic asthma there are coastal and due to the existence of abundant fungi in the air and in the household articles.

Bernton and Thom<sup>15</sup> report eight cases of vasomotor rhinitis sensitive to fungi.

Femberg<sup>16</sup> in his criticism upon previous reports on the rôle of fungus in respiratory allergy makes the following remarks "The majority of reports fail in one or more of the following particulars. There is a tendency to cite only a case or two emphasizing the rarity of mold allergy. In most instances there is no statement of the number of patients tested among whom the positive reactions were found. In practically none of the previous articles does the author adopt routine use of fungus allergens in his skin tests." In his work, therefore he adopts routine tests with fungus extracts on allergic patients and draws the following conclusions

(1) Sensitization to fungi plays an important role, direct or complicating, in the causation of asthma, hyperesthetic rhinitis and hay fever

(2) In a series of 243 patients with respiratory allergy, sixty-eight (29 per cent) had positive cutaneous tests to one or more of the fungus extracts enumerated

(3) The majority of these fungi were the ordinary molds whose air borne spores form a ready opportunity to cause inhalant allergy

(4) In a total of 590 patients, consisting chiefly of various forms of respiratory allergy in whom tests with yeasts were made, sixty-five (11 per cent) reacted

(5) Fungus sensitive patients are usually sensitive to house dust, but patients sensitive to the latter may or may not be sensitive to fungi

I would include in the above group some of the so called atopic dermatitis cases which frequently show the presence of respiratory allergy

Other writers on the subject of mold allergy include Cadham<sup>17</sup> reporting a case of asthma due to grain rusts, Bernton<sup>18</sup> mentioning a case due to *Aspergillus fumigatus*, Cobe<sup>19</sup> a case due to a tomato vine mold, *Cladosporium fulvum*, Credille<sup>20</sup> a case due to *Aspergillus fumigatus* and Vaubel,<sup>21</sup> a case due to yeasts growing on plants

The rôle of fungi in dermatology has been well covered in numerous papers and repetition is unnecessary. No new clinical varieties have been described since Dr C J White's descriptions in 1919 and 1927.<sup>22, 23</sup>

The biologic investigations have been well reviewed by Dr Arthur M Greenwood in his paper on Fungus Diseases of the Skin.<sup>1</sup>

An attempt will be made to discuss briefly the hematogenous spread of dermatophytes. The works of Sutter,<sup>24</sup> Bruusgaard,<sup>25</sup> Jessner,<sup>26</sup> Artz and Fuhs,<sup>2</sup> Fried and Segal<sup>28</sup> and others prove that the spread of fungus infection can take place through the hematogenous and lymph routes. Sutter was able to isolate the *Trichophyton granulosum* from the lymph node

of a patient with kerion and a lichenoid exanthem. Bruusgaard reports the case of a patient aged sixty-eight with a severe kerion of the beard of two months' duration. The temperature was 38 c and he was prostrated and had pains in the joints and muscles. An injection of trichophyton gave a weak reaction. Within two days of admission he developed a general nodose eruption the lesions varying in size from one-fourth to one inch. Miliary pus foci developed on the surface of these lesions and around the older lesions fresh papulopustules appeared. A fresh nodule barely twenty-four hours old was excised and microscopic examination showed bodies like spores, while culture produced a growth of *Trichophyton gypsum* the same organism as that recovered from the beard. There does not seem to be any reason to doubt that the infection was hematogenous in this case. Jessner obtained a positive blood culture of *Trichophyton gypsum* in a case of tinea barbae. Artz and Fuhs have obtained a growth of *Micosporon audouinii* from the blood of a patient with a microsporion infection of the scalp. Fried and Segal state that Saeves reproduced for the first time cutaneous lesions in a guinea pig infected intracardially with *Trichophyton gypsum* and *Achorion quinckeanum* while Kogoj was able to reproduce cutaneous dermatoses by injecting emulsions of spores of *Achorion quinckeanum* in the lumbar sac, the subarachnoid spaces the testicles and the liver. Fried and Segal reproduced cutaneous lesions in the following manner. They used a culture of *Trichophyton gypsum* which was emulsified in salt solution and then filtered. The emulsion was introduced into the marginal vein of the ear of twenty-nine rabbits and positive results were obtained in eleven (38 per cent). The lesions in all animals appeared only in scarified areas of the skin. They explained the localization of the lesions as follows. When introduced into the blood trichophyton remains in the circulation for a certain period. In instances in which the skin is intact the normal wall of cutaneous capillaries serves probably as a barrier interfering with their "diapedesis" and therefore with the ultimate formation of a skin lesion. Shaving scarification or any other factor leading to local inflammation favors the migration of the parasite from the papillary capillaries into the skin.

*Occupational Dermatoses and Fungi*—The question of the relationship of fungus infection to industrial disability is frequently a difficult one to answer.

In general it is now held that a primary fungus infection is not compensable unless its source can be proved to be a contact in the industrial plant concerned. Of the large number of industrial hazards only a few are known to



treating them better than potassium hydroxide alone, but it is especially advantageous in cases where yeast-like budding cells appear in preparations. In such cases the use of potassium hydroxide alone requires the greatest of caution for many times fat globules also assume such forms and a positive diagnosis must be given with reservations. When, however, such preparations are stained with lactophenol cotton blue, after treatment with 10 per cent potassium hydroxide the scales are sufficiently cleared and the artefacts are not present while the stained budding yeast-like cells are easily recognized.

**Allergy and Fungi**—Under the topic of allergy and fungi we have to consider (1) fungous infections of the skin and its appendages with a resulting eruption which does not show the presence of fungus on direct microscopic examination or on cultural studies. These eruptions are termed "ides". They may vary in type and may be found on the extremities or elsewhere. For example, the lichenoid eruption that may occur with kerion. Fever and constitutional symptoms have been reported.<sup>1</sup>

The first notice of generalized eruptions occurring in connection with focal mycotic infection was taken by Jadassohn, who in the discussion of Bloch's paper on trichophytosis, described several cases of kerion, in which some lichenoid papules were scattered over the trunk. Since then numerous references on the subject have appeared in literature but time and space will permit only a brief mention. Particular reference is made to the excellent papers by Dr. Charles M. Williams.

Numerous reports are found in the literature on the scratch and intradermal tests to trichophyton and oidiumyein but the interpretation varies. However a good working rule based upon the various findings may be said to be as follows. A positive scratch or intradermal test to trichophyton indicates either a present or past infection. One must remember that an infection in the past may still give a positive test although the present dermatologic condition is not at all related to the test. A negative test however is of much greater importance, since it frequently rules out the possibilities of infection. In other words, the trichophyton test is quite comparable to the tuberculin test. Sulzberger and Lewis<sup>2</sup> by means of contact or patch tests with trichophyton demonstrated that products of fungi are capable of causing an eczematous eruption on a hypersensitive skin. Sulzberger and Kerr<sup>3</sup> also recorded a case of a man with tinea of the hands and feet who gave immediate marked urticarial wheal reactions to intradermal trichophyton tests. With this patient's blood serum they were able passively to transfer the urticarial trichophyton hyper-

sensitivity to the skin of normal persons—individuals, thus demonstrating the presence in the blood of Prausnitz-Kästner antibodies of specific reagins. Wise and Sulzberger<sup>4</sup> reported the case of a patient with dermatitis and occasional attacks of urticaria, asthma and hay fever in whom an intradermal test with trichophyton produced an acute attack of hay fever and a generalized urticaria necessitating the administration of epinephrin for relief.

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In general it is now held that a primary fungus infection is not compensable unless its source can be proved to be a contact in the industrial plant concerned. Of the large number of industrial hazards only a few are known to

be directly responsible for the causation of a dermatomycosis. Instances where a fungus infection is superimposed upon an industrial dermatosis are more frequent.

*Fungi and Internal Medicine*—When fungus diseases are referred to, one immediately thinks of the dermatomycoses and is more or less unaware of the possible damage these pathogenic fungi can do to the viscera. It is true that thus far most of the literature on pathogenic fungi has been written by dermatologists, notably Sabouraud, Jadassohn, Bloch, Castellani, Weidman, Williams, and a good many others, yet one does find scattered reports of diseases of the various organs caused by fungi, particularly those in the yeast-like group. I shall attempt to give a brief summary.

*Meningitis Due to Fungi* About thirty two cases of torula meningitis are thus far reported in literature. Two of these cases have been reported by Stoddard and Cutler<sup>20</sup> in 1916. Blastomycotic infections of the meninges have been recorded, notably by Badham,<sup>30</sup> Swift and Bull,<sup>31</sup> Williams<sup>32</sup> of Australia, and Gaspar<sup>33</sup> in the United States. Hyslop, Neal, Kraus and Hillman<sup>34</sup> described a case of sporotrichosis meningitis and cited about ten cases recorded in the Italian literature, with five others from miscellaneous sources. Cann and Hollis<sup>35</sup> recently reported a case of actinomycotic meningitis in a girl of nine years, and said that Herbert had found reports of twenty-five other cases in the literature, but that they have not been proved culturally. Cases of moniliasis with meningeal involvement have also been reported.

Bronchopulmonary moniliasis has been reported from practically all parts of the world. Castellani described this disease as early as 1912.<sup>36</sup> Numerous other papers have followed, but the number of reported cases in American literature is rather sparse.<sup>37</sup>

The monilia organism may be the primary etiologic agent, but it must be borne in mind that frequently this organism may be a secondary invader in the air passages of individuals infected with some primary bacterial agent.<sup>38 39 40 41</sup> The finding of monilia in the sputum is not sufficient for a diagnosis of bronchopulmonary moniliasis. This condition is usually caused either by direct contact or inhalation, or may result from the extension of oral or cutaneous lesions.

Bronchopulmonary moniliasis has been divided into three clinical types.<sup>38 42</sup> The classification is based chiefly on the severity of the infection. The mild type is associated with cough and mucopurulent sputum. Examination of the chest in these cases is often negative but it is not unusual to find a few scattered

râles. The clinical course frequently extends over a period of several months, at the end of which time these patients may recover spontaneously or the case may go on to the severe type. The moderate type presents the picture of bronchial catarrh, fever, cough, paroxysmal dyspnea and anemia. In other words, the third type simulates tuberculosis a great deal. Examination of the chest may reveal signs of pleural thickening or consolidation. These cases are frequently fatal.

Both acute and chronic types have been described.<sup>43</sup> In the former the onset is sudden and rapidly terminates fatally. The chronic type is usually slow in its onset and tends to follow a protracted course with frequent remissions and exacerbations, lasting in some instances over a period of ten years.<sup>44</sup>

A discussion on thrush and sprue is omitted since there is a good deal published on these subjects.

Now for a bit of imagination, for after all, imagination has played a great part in scientific discoveries. Therefore the one with imagination and a partiality to mycology asks himself the following questions: "How about bronchiectasis? May it not be due to a fungus, for it does seem to follow a course similar to diseases caused by fungi, i.e., its chronicity and its afebrile or low fever course. Has ulcerative colitis been eliminated from the class of diseases caused by fungi? How about so called idiopathic splenomegaly?" We are aware of the involvement of the spleen in systemic fungus diseases.

Fungi have been blamed for practically every known disease, but the burden of proof is upon the reporter of these cases. Thus far too many reports of diseases due to fungi without substantiation have found their way into the literature. On the other hand, it is very important to bear in mind the causal relationship of fungi to disease.

*Treatment*—I propose to mention the more important facts relative to the treatment of fungus diseases. Since these diseases are contagious and infectious, particularly the dermatomycoses, it is advisable to mention prophylaxis first. The patient must be warned against contact with leather or woollen objects of dress, toilet, and sport. Only boilable material should be worn next to the skin. In the case of tinea capitis the child should wear a boilable cap made of gauze or the top of a stocking under his outer cap.

The following rules are to be observed in the prophylaxis of epidermophytosis.<sup>45</sup>

- 1 Never walk around on any floor in bare feet. Never wear anyone else's slippers or shoes.

- 2 Before removing slippers place a towel on the floor of the shower or wear rubber bathing slippers
- 3 Place a fresh bath mat or newspaper close by the tub or shower and stand on it when stepping out
- 4 Wash the feet at least once a day with soap and water
- 5 Dry the feet thoroughly, being careful not to leave any moisture between the toes, using a separate towel for the other parts of the body if there are any signs of infection such as maceration itching, or burning Powder the feet lightly, especially between the toes, using any borated (unscented) talcum

**Stockings** Wear light cotton or silk stockings Change them at least once a day Never wear woolen stockings

**Shoes** Change shoes at least once a day Never wear rubber soled shoes or sneakers Sterilize shoes as follows soak tissue paper or paper toweling in a solution of formalin Fill the shoes and slippers completely with the soaked paper Put the shoes in a box or paper bag tie with a string and place in a closet for twelve hours At the end of the twelve hours remove all the paper and place the shoes in the sunshine to air and dry for twenty-four hours

**Bathroom and Shower Bath** As far as possible these rooms should be in a sunny well-ventilated location, and the floor should be kept scrupulously clean and free of unnecessary moisture The floor of the shower should be arranged so that the water is not allowed to remain stagnant The value of the antiseptic foot baths before and after entering the tub has not been proved to be most satisfactory In fact in some instances I believe it might prove to be a good breeding place for some fungi

In the case of the swimming pool, one should use bathing shoes in going to and from the pool

One cannot emphasize too much the importance of a thorough examination of applicants for admission to public gymnasiums, and so forth, and the exclusion of those showing the minutest evidence of the disease, because they can be carriers

The results of treatment of fungus infections, particularly of the skin, are not as a whole therapeutic triumphs The mere fact that there is such a multiplicity of drugs used is proof that none of them represent a real specific treatment I feel that not until we attain a more complete knowledge of the specific fungus involved and its immunology will there be real therapeutic triumph in this stubborn

and troublesome disease Nevertheless, the following suggestions are valuable

In systemic fungus infections, in bronchomycosis, in dermatomycosis with an accompanying allergic eruption (id) and in refractory cases of dermatomycosis the use of ethyl iodide inhalations is advised (Swartz, Blumgart, Altschule<sup>45 46</sup>) Favorable results have also been reported with the intravenous iodine therapy Large doses of potassium iodide by mouth have also been recommended My experience has led me to believe that the best results are obtained with ethyl iodide inhalations However, this may be a case where the results are best in the hands of the originator

Variable reports are found in literature regarding the value of trichophyton, but my experience supports Dr Greenwood's contention that it has not been of definite value in the majority of cases It is possible, however, that the vaccine in greater dilution as suggested by Templeton<sup>47</sup> will give better results For the past six months I have used at the Massachusetts General Hospital a preparation known as Dermatocol with rather encouraging results, particularly in onychomycosis It is too early, however, to evaluate this form of therapy Dermatocol is a polyvalent vaccine prepared from equal parts of 300 strains of Trichophyton, Microsporum Achorion, Endodermophyton and Epidermophyton This preparation is rather highly recommended by the Brazilian dermatologists

Autogenous vaccines have been recently used and the results evaluated by Robinson and Grauer<sup>48</sup> Their report is quite optimistic I believe that Wise's<sup>49</sup> suggestion is valuable He states, "By pooling the findings on many patients, employing suitable controls and improved methods, dermatologists could clarify a nebulous terrain and conserve much work and time"

**Local Treatment in Dermatomycosis**—1 The acute vesicular type (hands and feet) This type is best treated by soaks and wet dressings, either of saturated boric acid solution, potassium permanganate 1-1000 or weaker, or metaphen 1-3000 In the case of pustulation the use of boric acid solution soaks followed by the application of the following ointment has proved valuable

R	
Mercurochrome crystals	gr x
Aquae	m xx
Acidi salicylici	5 ss
Petrolati	5 ss
Lanolini	5 ss
m	

Caution Do not use irritating preparations as they are apt to set the condition on fire

2 The subacute and chronic type These

types are best treated with a sulphur and salicylic ointment, six per cent strength or Whitfield's ointment. One per cent thymol may be added to either of these ointments. The above mentioned mercurochrome ointment has been used successfully in this type.

In the hyperkeratotic type (particularly found on the plantar aspects) the use of either of the following ointments is recommended

R		R	
Chrysarobini	gr v xv	Iodine crystals	gr x
Acidi salicylici	3 ss	KI enough to dis-	
Sulphuris		solve the iodine	
praecipitatis	3 ss	Acidi salicylici	gr xv
Petrolati	5 ss	Petrolati	5 ss
Lanolini	5 ss	Lanolini	5 ss

X-ray in the subacute and chronic cases is of distinct value when used in fractional doses, having in mind its limitations and dangers, but it should not be used in the acute types

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## DISCUSSION

THE CHAIRMAN. This paper is now open to discussion

DR ARTHUR GREENWOOD Boston. I congratulate Dr Swartz on his handling of a difficult subject. I feel quite sure that it will lend itself to publication very well, and be very useful for a general consideration. I also want to congratulate him on his courage in making dogmatic statements in regard to classifications and things like that. I think doing that is a means of getting the subject into proper form. If you try to teach anyone to know all the exceptions to a subject to state what it may be or what it may not be the student gets nothing from it. But, in making dogmatic statements he will discover his exceptions later and I think more or less dogmatic statements on classification for instance or diagnosis of a disease are useful. I am quite sure the mycologists will not agree with him however.

One other thing I wish Dr Swartz would do some time and that is to give us a thorough discourse on his ethyl iodide treatment. I am quite sure it is worth while. I don't think it has ever had a complete exposition of its use in Dr Swartz's hands.

DR. C. GUY LANE, Boston Dr Swartz has correctly said that the diagnosis of fungus infection is made more frequently than formerly. The statistics which are accumulating indicate that among the most frequent diseases the diagnosis of fungus infection is approaching or perhaps surpassing that of eczema.

I should advise in this connection some little caution in making use of this diagnosis in palmar lesions especially. I think the work of Mitchell for example in connection with streptococcal infections the work of Andrews and the fact that in many cases of our hand lesions we are unable to find fungus through microscopic examination and culture, make us wonder about these indeterminate things which are called fungus infections. We should try to confirm our diagnosis so far as possible by culture or by microscopic examination.

Dr Swartz classified his industrial cases in two groups. It seems to me we might carry that distinction just a little bit farther. He spoke of the primary fungus infection. There are very few extremely few and I believe we can dispel the possibility of many primary fungus infections occurring in industry. We can visualize it in the handling of wool perhaps in the wearing of wool lined gloves but there are but very few primary fungus infections of occupational origin.

On the other hand I believe that his secondary group of infections, that is the fungus infections occurring as a complication of the original dermatoses is a much larger group. We see numerous cases I believe in whom such complications occur. Then I think there is a third group of fungus infection relating to industry in which fungus infection may be very definitely exaggerated by occupational factors. In some states in which it is allowed this group of cases exaggerated by work may be compensable. Then a fourth class has been suggested—I haven't yet seen any in this group but a group has been suggested I think by Cleveland White of Chicago where a previous fungus infection may sensitize the skin to an industrial irritant. I am not sure that this may occur but there are at least three groups in which there may be a relation to occupation.

THE CHAIRMAN: Are there any other gentlemen who wish to speak? I am sure there will be a great many questions regarding this paper. The point has been raised about fungi in industry and I wish some of you gentlemen would elaborate that point.

DR. J. HARPER BLAISDELL, Boston: Those of us who are called upon to give medical testimony in industrial cases I can assure you are clothed in a miasmic fog of confusion when it comes to the interrelation of fungus disease and industrial dermatitis. The law in this Commonwealth states that a man who receives injury causally related to his employment is entitled to compensation and I agree with the previous speakers who say that a primary fungus infection of industrial origin is a very rare thing.

The other day I came across this situation. A large industrial plant in which it was necessary for the workers to change their clothing completely before and after working provided the men with a shower bath in other words club facilities. In that plant at that time there was starting an epidemic of fungus infection of the feet. Does that constitute an industrial dermatitis causally related to employment? That is a question in that particular instance which the Courts have yet not decided.

Now of course we do see a great many cases of secondary fungus infection following injury and industrial dermatoses and under the law the work-

man is entitled to compensation not only for the original industrial dermatitis but for the secondary complications from the fungus infection which may last many weeks after the original dermatitis.

I call your attention to this situation. It is authoritatively stated that most of us are carrying fungi of some sort about our person. I think it is a fact that an industrial dermatitis, superimposed either upon an occupational fungus infection or a quiescent fungus infection, may result in lighting up a very active fungus dermatitis. But should we take refuge behind that fact that every one of us probably has fungi and say that in the specific instance this man had an original fungus infection which has been lighted up and therefore we do not expect to be liable from the resulting chronic fungus infection. That is an important medical point because under the law in this State if a man with an original nonindustrial condition acquires an industrial dermatitis which lights up his first non industrial condition he is not entitled to compensation beyond the length of time ordinarily required to take care of the industrial condition. In other words a man with syphilis, who receives industrial injury which lights up his syphilis, does not receive compensation for the rest of his life for the original syphilis but only to the extent of taking care of his industrial injury. All of these facts I think make for confusion and it is for us to determine to what extent this situation can be clarified.

THE CHAIRMAN: Any further discussion? If not I will call upon Dr Swartz to close the discussion.

DR. SWARTZ, Boston: I want to thank those who discussed this paper. Dr Lane is perfectly correct in adding a third group. I fully agree with him. In answer to Dr Greenwood's question I wish to state that I disapprove of rubber-soled shoes because they cause excessive perspiration which is a good background for fungi.

Under the discussion of the relationship of fungi to internal medicine I did not have the time to cite the following case which I saw at the Massachusetts General Hospital. A woman aged 45 had an unexplained temperature and complained of excessive pains in the lower extremities. On examination she showed the presence of an enlarged spleen. All laboratory tests including Widal were negative. The spinal fluid upon cultural studies did not show the presence of any bacteria. Because she had a chronic paronychia and some dermatosis of the hands a dermatologist was consulted. Because of the monilia infection of the nails I felt it wise to study the spinal fluid, blood and urine for the presence of a similar organism. Both the centrifuged spinal fluid and the urine when planted on special media, showed the presence of a monilia similar to the one found on the nails. One blood culture was negative. I believe that repeated examinations might have resulted in similar findings.

I was asked to discuss ethyl iodide inhalation therapy. I have already described it in literature but I shall outline it briefly again. The purpose of ethyl iodide inhalation is to maintain massive concentration of iodine in the blood stream. When using ethyl iodide be sure to get the pure preparation, free from phosphorus that is a nontoxic iodine preparation. We have devised a special sort of inhalation apparatus for ethyl iodide. The dosage we use in adults is one and one-half cc per dose which is the equivalent of three grams and increase one-half cc per dose to three cc which is equivalent to six grams. In some cases the dose is as high as five cc or ten grams. It is administered on two successive days skipping the third day. The number of treatments depends on the condition treated. We have found that infections caused by the yeast



organism require a greater number of treatments than those caused by the ringworm fungi. The only serious complication we had was peripheral neuritis which cleared up in about three weeks after the cessation of the inhalations. Only two such complications occurred in a series of about 500 cases.

(Dr Joseph Muller of Worcester then presented his paper on 'Nevi'.)

THE CHAIRMAN Now, Gentlemen, it gives me the greatest pleasure to introduce to you Dr Marion B Sulzberger of New York City, than whom in his chosen subject of today, there is perhaps no one

in these United States who is such an authority upon the subject. We are fortunate indeed in having him with us, particularly as it was primarily announced, as you know, that Dr Louis Schwartz of New York of the United States Public Health Service, was to have spoken to us upon 'Industrial Dermatoses'. Unfortunately Dr Schwartz fell ill, and is still ill and cannot be here, and Dr Sulzberger, in answer to my appeal for a pinch hitter very graciously said, 'Why, surely'.

We owe him a debt for that too. As I say I take great pleasure in introducing to you Dr Sulzberger of New York City, who will speak to you upon 'Definitions and Classifications in Dermatologic Allergy'.

## REMARKS ON DEFINITIONS AND CLASSIFICATION IN CERTAIN FORMS OF DERMATOLOGIC ALLERGY\*

BY MARION B SULZBERGER, M D †

IT is most unfortunate that you will not have the opportunity of hearing Dr Schwartz's excellent paper on Industrial Dermatoses and that you will have to accept my rambling and unprepared discussion in its place. However, when, only a few days ago, your chairman, Dr Towle was kind enough to ask me to substitute for Dr Schwartz, he assigned my subject, and I told him that I would attempt to fill in to the best of my ability.

I would like to begin with the most difficult portion of this subject,—and that is, a discussion of the definition of the word "allergy". There are certainly many authors, even so-called experts in the field, who both in speech and writing use this term either loosely or, in some specific and exact but private manner, without defining the exact limits and boundaries of their own individual concept. I believe that both of these practices have led to confusion.

I shall, therefore, preface my remarks with the definition of "allergy" as first formulated by v Pirquet, as first employed by Schick, and as generally accepted by immunologists today, and state that I, too, have accepted and always employed the term in its original and classic sense. For to my knowledge no better and no more exact definition is available, and it is my belief that here, as elsewhere in scientific terminology, any radical modification in a concept demands the coming of a new term.

According to v Pirquet (1906), allergy designates any *acquired, specific* alteration in the capacity of an organism to react.

This alteration must be produced by a previous exposure or exposures in order to fulfill the requirement of being "acquired". And the alteration must be made manifest by subse-

quent exposure to the same or to immunologically related substances, in order to fulfill the requirement of being "specific".

You will note that this definition is extremely wide. It includes all acquired, specifically altered, reactions, regardless of the mechanism by which this alteration is produced, regardless of the substance (living or nonliving agents) which produces the alteration, and regardless of the nature of the alteration elicited (quantitative alterations—that is, alterations in the direction of hyperergy or hypersensitivity, of hypoergy, or of anergy and immunity are all thus included under allergy).

I should like to stress at this point that no mention is made of antibodies and that in this, the original concept of allergy, the demonstration of antibodies is not by any means an obligatory requirement for the inclusion of a specific alteration within this category of phenomena. Indeed, the vast majority of specifically acquired and classic allergic alterations of reaction seen in human beings are not accompanied by the formation of antibodies demonstrable by any known present methods or techniques.

In dermatology there are found many of the most clear-cut examples of such specific alterations in the capacity to react. A large number of these are indeed among the original examples of allergy mentioned by v Pirquet. I need remind you only of the altered reactions to vaccinia which appear on revaccination or after smallpox, the altered reactions to tuberculin which appear after tuberculous infection, and the altered reaction to diphtheria toxin as made manifest in the negative Schick test.

However, not only in these specifically acquired alterations in infectious processes, but more particularly in reactions to nonliving agents, the study of skin phenomena has yielded the most important contributions to basic

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principles in the field of allergy There are no more clear-cut examples of acquired and specific hypersensitivities than those which occur in the eczematous or contact type of hypersensitivity acquired by exposure to simple chemical substances For here, in contrast to the hypersensitivities in such conditions as hay fever and asthma, adequate experimental proof has been brought both that the skin hypersensitivity has been acquired and that it is specific I refer here to the experimental sensitization of the human skin with primrose (Bloch), with mercury and formaldehyde (Haxthausen), with orthoform (Schwarzschild), with mesotan (Silverberg), with paraphenylenediamin (R L Mayer), and innumerable other experimental sensitizations of this type

In the studies of such eczematous sensitizations to simple compounds, and in studies of drug eruptions, both of the fixed and of other types, dermatology has contributed toward a clarification of some of the most important principles in the modern concept of allergy One of these points deals with the fact that the shock tissue which enters into the reaction may be sharply limited and may embrace certain circumscribed portions of an organ, while other parts of the organ remain "immune" and do not participate in the allergic response This is well illustrated in the so-called fixed drug eruptions in which one or more circumscribed areas of the skin may react in a most violent manner while other areas remain without demonstrable reaction The sometimes isolated and circumscribed power to react which may be confined to a specific part of an organ is further evidenced by the division of skin reactions into eczematous responses and responses of urticarial type

Because of the importance of these two particular forms of dermatologic allergy, I should like to confine the remainder of my remarks to these two types of responses

#### EPIDERMAL REACTIONS

It is today granted by the vast majority of careful students of this problem that in the eczematous or so-called contact type of hypersensitivity, the epidermis itself is in all probability the primary shock tissue The response at any rate is *primarily* epidermal, and the vascular reaction in the upper cutis, while almost always present, is in all probability an accompanying or secondary phenomenon

I believe that this recognition of the epidermis (epithelium!) as a shock tissue is of an importance far beyond its practical significance in dermatology However, it must be granted that it has not yet been proved with absolute certainty that the epidermis alone is actually the sole site of hypersensitivity in eczematous responses, and while the mass of evidence cer-

tainly points in this direction, the problem merits further study

Nevertheless, the concept of an *epidermal* shock tissue proves of great heuristic value For from this premise alone may be deduced many of the outstanding characteristics of eczematous hypersensitivity

*First* The characteristic of the reaction time, that is, the time elapsing between the exposure of the hypersensitive epidermis to the specific allergen and the first appearance of the clinical manifestations of hypersensitivity In the case of eczematous responses, as is well known a period of hours to days elapses before the dermatitis appears This response is remarkably slow compared, for instance, with the explosive, immediate types of reaction seen in vascular, urticarial hypersensitivities

But the slow development of this reaction becomes comprehensible when we realize that the epidermis possesses no blood vessels, that is, includes no structures capable of almost immediate alterations in permeability or of speedy contraction and dilatation In the epidermis, therefore, the damage produced by the allergen must manifest itself slowly, with gradually increasing edema and eventually with the formation of the characteristic spongiosis and intra-epidermal vesiculation

*Secondly* If the epidermis is the shock tissue in eczematous responses, it must be evident that those substances which can reach this tissue unchanged and in the highest possible concentration, will almost inevitably be those which are most likely to sensitize and to produce the reactions of hypersensitivity It is obvious, therefore, that substances coming from the outside world, which reach the epidermis by external contact exposure, will prove to be the most common eczematogenous noxae For these agents will not have to undergo denaturalization, they will not have to be diluted by the blood stream, and they will not be prevented from reaching the epidermis by the usual, normal, relative impermeability of the vascular walls

*Thirdly* It is to be recognized that the living cells of the epidermis which constitute its only possible shock tissue are normally protected from external contacts by natural barriers These barriers are of both physical and chemical nature The two most important are undoubtedly the nonliving, horny protective covering of the stratum corneum and the fatty, water-repellent sebaceous film which covers the normal skin surface In addition to these two barriers, the healthy skin possesses the ability to neutralize both acids and alkalis

(I should like to state here in parentheses that I believe that minute but abnormal alterations in any of these protective mechanisms are in all probability of almost incalculable importance in predisposing to a state of susceptibil-

ity to epidermal sensitization. If this is true, it is most apparent that a study of the underlying constitutional or local factors which are capable of producing abnormalities of cornification, of the secretion of sebum, or of the acid-alkali neutralizing powers of the skin surface will undoubtedly tend to lead to an understanding of at least some of the factors which determine the mysterious, and often sudden, appearance of eczematous hypersensitivity.)

Assuming the epidermis to be the shock-tissue, from the mere consideration of the nature of the normal protective forces which shield the living epidermal cells, we may logically conclude the nature of many of those substances which will be most likely to produce eczematous hypersensitivity.

Keratolytics and substances possessing a capacity to precipitate, cleave, shrink or otherwise damage the horny layer will be capable of either themselves sensitizing or of preparing the way for sensitization by other substances. Caustics and alkalis (soaps, and so forth), acids, such as picric acid, formalin and similar agents belong to this group.

A second category embraces those substances which are either fat solvents or are themselves prone to enter into solution in fats, lipoids and oils. Here included are the many different forms of fat and lipid solvents and detergents, and above all, the oil fractions of plants (ragweed oil, poison-ivy oil and numerous other resins and oleoresins) and the animal fats (lanolin, and so forth).

In addition to these keratolytics and fat solvents and fatty substances, another group is presumably able to pass the natural barriers which protect the living epidermis. This group comprises ionizable chemicals of small molecular dimensions. The metal ions such as mercury, nickel and arsenic are common examples of this group.

There is a fourth group of substances which is obviously capable of coming readily into contact with the living epidermal cells and which therefore can be considered as potential allergic eczematogenous agents. This group comprises those substances which become fixed to the horny covering or which have a marked affinity for ectodermal structures. I would here include, first, the dyes which by their very nature form fast combinations with horny matter (paraphenyldiamin, azo dyes of all kinds and so forth), and also the local anesthetics (novocain, butyn, butesin, and so forth) with their well known affinities for ectodermal tissue.

A fourth characteristic which becomes self-evident when one considers the epidermis as the shock tissue in eczematous contact type sensitizations, is the indicated form of skin test. In order to bring to light epidermal hypersen-

sitivity, it is of course necessary to use that method of testing which will permit the most intimate contact of the allergen with the shock tissue concerned. Obviously, neither scratch tests nor intracutaneous injections serve this purpose. For both of these methods force the allergen through the epidermis and into the rapidly moving fluid currents of the superficial cutis, which carry away the bulk of the material, and thus prevent the necessary intimate and prolonged contact with the epidermal cells. The patch test must here be employed, for with this test the mechanism which has produced the clinical reaction may be approximated to some degree. The substance is applied to the skin surface and allowed to pass slowly through the protective coverings and to reach the hypersensitive epidermal cells.

As I have before stated, the response in eczematous hypersensitivity is a slow one and this makes it necessary to read the results of patch tests after twenty-four hour, forty-eight hour, or even longer periods have elapsed. The response usually reaches its maximum by forty-eight hours, but in some few cases several days may elapse.

I realize only too well that many of my statements in this connection are as yet unproved, and I submit all of the above, not as a dogmatic statement of facts, but rather as an attempt at clarification and the presentation of working hypotheses. I believe that experimentation may be based upon attempts to verify or disprove many of my statements, and that this line of approach cannot fail to produce results, not only of theoretic but also of practical interest.

For example, if the above considerations are correct, individuals with dry skins, lacking in the normal sebaceous covering, should prove more susceptible to eczematous sensitization with water-soluble substances and relatively immune to fatty excretants, while those individuals with excessively greasy skins would be more protected against water and soluble allergens and more likely to be candidates for sensitization to fat solvents and oil fat and lipid soluble allergens.

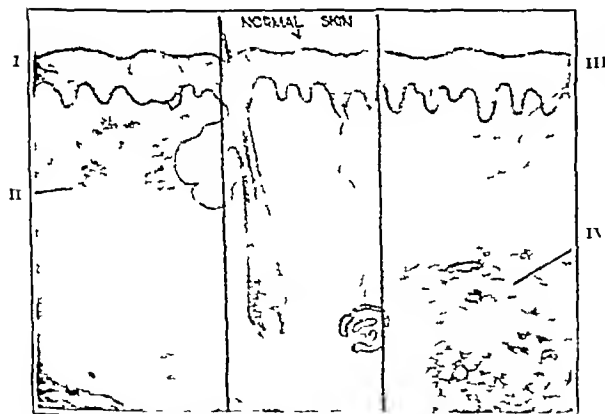
An experimental study of this question is indicated, for if the supposition should prove correct, this would undoubtedly be of practical value. To point out only one possible application it may be mentioned that workers with seborrheic skins could be chosen for processes involving exposure to water-soluble eczematogenous substances, while those with hyperkeratotic skins could be placed at work in which oily substances constitute the occupational hazard. Moreover those individuals with an adequate capacity to neutralize alkali at the skin surface could be selected for employment in such oc-

occupations as nickel plating laundering and so forth (An interesting study with bearing on this point has recently been reported by Burchhardt from the Dermatologic Clinic in Zurich)

The various other possible approaches to this complex problem which are obviously contained in the viewpoint I have advanced are too numerous even for mention here

I must make haste to emphasize that such simple explanations for variations of susceptibility to eczematous sensitization must not of course be considered as the answer to the question of why certain individuals at certain times become sensitized, while others under the same conditions of exposure remain immune My considerations have embraced only the simple and obvious local interferences with the normal protective mechanisms at the skin surface While these must be of great practical importance such alterations in local protection surely cannot fully explain the underlying fundamental immunologic factors which produce in one individual an almost incredible degree of susceptibility to eczematous hypersensitivity, and in another individual an almost complete immunity to this type of sensitization

A SCHEMATIC PRESENTATION OF THE COMMONER ALLERGIC SKIN REACTIONS BASED UPON (A) HISTOLOGIC LOCALIZATION AND (B) TIME REQUIRED FOR THEIR DEVELOPMENT



Reprinted from J. A. M. A. 104:1459 1935—Sulzberger Wise and Wolf

#### I ECZEMATOUS REACTIONS

- 1 Site of shock tissue epidermis
- 2 Reaction time 24 or more hours
- 3 Characteristic lesion spongiosis and intradermal vesicle
- 4 Causative substances frequently simple chemicals or products of fungi
- 5 Type of test patch test

#### II TUBERCULIN TRICHOPHYTIN TYPE REACTIONS

(Not Infrequently Combined With Eczematous Response)

- 1 Shock tissue upper cutis cutis
- 2 Reaction time 24-48 or more hours
- 3 Characteristic lesion lymphocyte and later epithelioid cell infiltration
- 4 Causative substances usually micro-organisms bacterial or fungus products (allergy of infection)
- 5 Test intracutaneous (48 hours)

#### III URTICARIAL REACTIONS

- 1 Shock tissue upper cutis (blood vessels)
- 2 Reaction time 10 to 30 minutes
- 3 Characteristic lesion edema extravasation of fluid and eosinophiles (wheal)
- 4 Causative substances foods inhalants products of micro organisms
- 5 Test intracutaneous scratch or indirect (immediate wheal and flare)

#### IV MISCELLANEOUS REACTIONS

- (Drug Eruptions IDS and so forth)
- 1 Shock tissue deep cutis cutis epidermis follicles
  - 2 Time minutes to days
  - 3 Lesions (a) nodules (b) fixed areas (c) multiform dermatoses and follicular lesions and so forth
  - 4 Substances drugs micro-organisms
  - 5 Test usually inconclusive sometimes the patch Moro or intradermal test is of value

Before leaving the group of eczematous sensitizations I may mention that sensitizations to fungous products when evidenced by eczematous or dyshidrotiform reactions are in all probability to be included in this category And here again the premise that the epidermis is the shock tissue permits us to recognize the pathogenesis of eczematous hypersensitivity to fungi The fungi which produce eczematous responses cannot, as a rule multiply in living tissues (W Jadassohn and the author) and are therefore confined to the nonliving media of the horny layer the nails and the hair When the products which emanate from these fungous cultures in the horny layer pass downwards they first reach and thus first sensitize the epidermal cells

Consideration of this process may serve to explain the intertriginous sites of many fungous affections For in these areas the macerated and nonliving debris forms a medium for the multiplication of the fungi and for the ensuing production of amounts of fungous allergen which eventually "break down the resistance" and produce the reactions of hypersensitivity

In a like manner, all influences which tend to the production of hyperhidrosis (nervous upsets excitement sports tight or ill-fitting footwear and so forth) or to increased accumulation of moisture on the feet in the interdigital spaces (swimming pools improper drying, and so forth) will lead to an increase of nonliving material as soil for fungi and will thus tend to produce attacks or exacerbations of dermatophytosis and dermatophytids

#### VASCULAR REACTIONS

The second group of important skin allergies has characteristics which are in most ways in sharp contrast to the eczematous hypersensitivities just discussed This second group includes the so-called urticarial or "wheal" and "flare" reactions The important representative of this type of skin allergies is not in my opinion one of the true urticarias, for I believe that the disease known as urticaria, and particularly the chronic form, has not in the ma-

majority of cases been proved to be actually based upon an acquired, specific alteration in response, that is, upon an allergic mechanism

I believe, however, that that form of dermatosis which has been called neurodermatitis disseminata, pruritus with lichenification, prurigo diathésique, and by many other names, and which we have now agreed to call *atopic dermatitis*, is based upon a submanifest, subclinical, wheal type of reaction, and it is to this dermatosis and to the skin tests elicited in this dermatosis that the following remarks are intended to apply

As is well known, atopic dermatitis is associated both in the individual and in his family, with asthma, with hay fever and with a certain form of infantile eczema which is best designated as an "atopic dermatitis of the infant" If this disease is, as many observers believe, essentially due to a specific hypersensitivity, it is certain that this hypersensitivity is fundamentally and intrinsically different from that found in the truly eczematous or contact-type dermatitis For here, the shock tissue is certainly not the epidermis, but is the uppermost vascular layer of the cutis

Here again the mere consideration of the site and nature of the shock tissue leads inevitably to conclusions regarding the clinical and histologic characteristics of the dermatosis, the nature of the causal allergens, and the type of skin test which must be employed

In this form of hypersensitivity the blood vessel wall is the shock tissue Thus, obviously, those substances which can be borne by the blood stream are those most likely to reach the shock tissue in sufficient concentration (In exceptional instances, and perhaps in infantile eczema even as a rule, *substances may be able to pass through the epidermis* and elicit reactions in the superficial cutis vessels—*transepidermal penetration*)

Since the hematogenous route is the usual one in the clinical production of this vascular reaction, a certain group of substances is immediately suggested as a common cause of this form of cutaneous allergy Only allergens which are on the whole compatible with the blood fluids are likely to be carried as more or less usual constituents of the blood stream The allergens in this group are therefore likely to be water soluble, and very often the so called protein fractions They usually emanate from ingested foods or from the inhalation of environmental allergens and their subsequent absorption and hematogenous distribution

It will be seen that this group of allergens corresponds to a high degree to those excitants which produce hay fever, asthma and vasomotor rhinitis And just as it is probable that asthma and vasomotor rhinitis can be caused by the products of micro organisms emanating from

some distant and often hidden focus, so it is also probable that atopic dermatitis may, in some instances, be based upon such excitants

I shall not here enter into a discussion of the relative importance of the various nonallergic factors in the production of the itching and of the skin manifestations of atopic dermatitis I have elsewhere discussed the possible influence of neurogenic and psychogenic factors, and of other constitutional or systemic influences (vasomotor instability, endocrinopathy, and so forth) Suffice it to say that, while it may vary within wide limits from case to case, the influence of these nonallergic factors is often apparent But it must be stressed that the demonstration of even marked effects of such systemic influences in no way refutes the evidence for the essentially allergic nature of this dermatosis For it is well known that allergic manifestations of the most typical and characteristic kind are susceptible to the influences of the psyche, the nerves, the blood vessels, the hormones, and of a host of other systemic factors

The consideration of the vascular site of the hypersensitivity in atopic dermatitis helps us to understand the frequent association of positive, specific skin tests manifested as wheal and flare reactions which are so often found in asthmas and particularly in hay fever For these two last-named diseases are also primarily vascular reactions, in which a different part of the vascular tree is the site of the shock. The pathogenesis of asthma and hay fever is closely akin to that of whealing in all three, the superficial blood vessels are hypersensitive, and the contact with the specific excitant increases their permeability and produces extravasation of fluid and of certain cells (eosinophils) In the lungs, this phenomenon is followed by contraction of the bronchioles, and by the other manifestations of asthma, in the conjunctiva and the nasal mucosa, by epiphora, rhinorrhea, and the other manifestations of hay fever, and in the skin, where the fluid cannot escape but remains confined by the overlying, impermeable epidermis, whealing—either clinically apparent or subclinical—is the immediate result

It is my concept that atopic dermatitis—whether it be in the infant, the child, or the adult—is due to subclinical whealing, and that thus subclinical whealing and the accompanying pruritus eventually lead to the epidermal involvement and to the eczematoid and lichenified appearance I believe that in infants the epidermis is less impermeable, both from within and from without, and that we therefore see not only transepidermal penetration of allergens, but also transepidermal penetration of extravasated fluids, with the resultant weeping, oozing, crusting, and even spongiosis and vesiculation (In contrast to the infantile form in the childhood and adult types of atopic der-

matitis, the eruption is dry, and, as is well known, spongiosis and vesiculation are consistently absent.)

I may say, therefore that I conceive of atopic dermatitis as primarily a subclinical urticarial reaction, and that the epidermal changes are, in my opinion, secondary in nature. This stands in sharp contrast to the eczematous contact hypersensitivities, in which it is probable that the epidermis is first involved and the vascular changes are secondary.

The fact that the blood vessels are the shock tissue in wheal-type reactions indicates not only, as before stated the nature of the responsible allergens, but also the time which may be expected to elapse between the exposure of the shock tissue to its specific allergen and the first appearance of the clinical manifestations. Here the blood vessels, with their capacity for speedy contraction, dilation, and change in permeability constitute the shock tissue, and here therefore, the time required for the reaction to develop will be only a question of minutes. The wheal and flare reaction in the skin is called the "immediate" reaction. This reaction is acute and explosive, just as in the attack of asthma or of hay fever.

Furthermore, in this form of hypersensitivity, we must again employ a test which brings the causal allergens into immediate contact with the shock tissue. For this purpose, we must impel the causal and so-called "protein" allergens (derived from foods and inhalants) through the epidermis, and place them in the vascular layers of the superficial cutis. Either the scratch test or intracutaneous injection is the adequate and correct method.

Since the most experienced allergists disagree as to which of these two means of testing is preferable it may be stated that, for dermatologists and for all not confining their practice to allergy, the scratch test should be the method of choice. It obviates the necessity for expensive and perishable paraphernalia, for keeping hundreds of separate syringes (to avoid the element of syringe contamination). It does away with the necessity for sterile solutions and technique. And, above all, it obviates to a great degree, the dangers of systemic and, in some cases even of fatal reactions.

Perhaps I have unwittingly created the impression that all cases of atopic dermatitis can be cured by immunologic measures alone. This is far from my intention and far from the truth. There are, in my opinion many as yet unknown factors in the pathogenesis of this dermatosis.

While in my material the identification and elimination of the proper allergens have brought about striking improvement in some cases, in many others the most rigid exclusion

of suspected excitants has proved of no avail. In my experience it is the rule that the younger the patient (infants included), the greater the likelihood of the success of allergen elimination. Moreover, it may be stated in general that the younger the patient, the greater the rôle of foods, while the older the individual, the more polyvalent the hypersensitivity, the more prominent will be the part of environmental and inhalant excitants (L. W. Hill and the author). This is perhaps one factor which makes the management of the older cases more difficult.

From the immunologic side, the best we can do today in the practical treatment of atopic dermatitis is to try to eliminate all the known common causal excitants. The patient's room, for example should contain no needless dust producers (pillows, mattresses, overstuffed furniture, and so forth), and no dust catchers (drapes, carpets, rugs, and so forth). The safest bedding is sterilized horse-hair (even for those sensitive to horse dander!). Silk, feathers, kapok, and orris root have been shown to be particularly active allergens in atopic dermatitis. Among the foods, not one is above suspicion. But the most common offenders, as is well known, include eggs, wheat, milk, and fish. I believe that chocolate (cocoa) may be added to this list.

Such elimination measures, plus the judicious use of x-ray, and particularly when combined with the art of selecting the topical remedies best suited to the individual case, promise to give the best results. Systemic measures (including thyroid extract, cortical extract, arsenic, bromides, calcium, vitamins) seem to benefit some cases. And it is certain that the psychic and nervous state, if abnormal, merits attention, and that foci of infection (fungi, streptococci, staphylococci) must be sought and if possible eliminated.

In otherwise hopeless cases, hospitalization or other change of environment often produces abrupt and almost miraculous improvement. The cause of this striking influence of environment (clearly to be seen in infantile, and childhood, as well as in adult atopic dermatitis) may ultimately lead to a better understanding of the possible importance of as yet unrecognized environmental allergens (house-dust? fungi?)

I know that if I do not volunteer the information I shall be asked concerning specific hyposensitization treatment. In my hands this has proved useless in all those cases of unquestionable atopic dermatitis in which I have been able to give the usual measures a fair trial.

This is in sharp contrast to my success with specific hyposensitization in contact dermatitis due to pollen and plant oils (ragweed and ivy oil, tulip oil and chrysanthemum oil).

I am not surprised at this failure of present methods of specific hyposensitization in atopic dermatitis. For, similarly it is apparently extremely difficult to reduce the wheal-type hypersensitivity of the skin by present methods. This is brought home strongly by the observation of the persistence of wheal reactions of the skin, even in patients who have received hundreds of injections for the control of hay fever or asthma, and, surprisingly enough, the wheal skin reaction often persists in spite of the successful clinical desensitization of the mucous membranes and in spite of complete clinical relief.

As I have stated above, I have come to consider the manifestations of atopic dermatitis to be based upon a type of subclinical whealing. And since it has been shown that wheal-type re-

actions of the skin cannot as a rule, be materially reduced by present hyposensitization measures, I cannot find it astonishing that these same hyposensitization measures have, thus far, met with little or no success in what I hold to be the analogous whealing of atopic dermatitis.

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I regret that time does not permit me to consider here the manifestations and problems of acquired, specific alterations of the skin in infections, in drug eruptions, and in other processes. However I hope that some day I shall be permitted to discuss before this Society these other forms of skin allergy.

CHAIRMAN TOWLE Our next paper is by Dr Edward C Sullivan of Springfield Dr Sullivan

## THE DOCTOR AND EARLY SYPHILIS\*

BY EDWARD COPPINGER SULLIVAN, M.D.†

THIS paper is rather elementary in its scope, but at times it is well to get down to fundamentals and review what we know, what we should know, what advances have been made in some particular field, and analyze our mistakes of the past in order that we may more ably conduct ourselves in the future. It is addressed especially to three classes of erroneous thinkers: those doctors who believe that when the objective symptoms disappear under a little treatment the patient is cured, those who believe it is a hopeless situation at the best, so what is the use, and those who believe that their clientele is so fine or refined, and syphilis such a rare disease there could be none of it among them.

A good many years ago Dr Osler said that we would be better doctors if we took down our impressive Latin diplomas which none of us could read anyway, and put in their place in large letters this admonition: "Never forget that there are two diseases, tuberculosis and syphilis." Judging by the record that has been made in the control of tuberculosis in Massachusetts in the past thirty-five years, someone must have taken heed of the first part of that advice as that disease has been reduced to about twenty-five per cent of what it was in the year 1900. There has also been a glorious record made by the medical profession in the control and practical elimination of typhoid and diphtheria.

By contrast, the record of syphilis offers a sad commentary of sloppy thinking "pussy-footing" and general ineffectualness on our

part as it still ran on like the babbling brook, unrestrained, until most recently. If we take into account the difference in the communicability of tuberculosis, diphtheria and typhoid, as compared with syphilis, there must be some answer as to why the latter has thrived all these years. There is an answer and a large proportion of it is a quite simple one and may be summed up in lack of education of the public, and lack of education of the doctors.

The United States Public Health Service makes a conservative estimate that there are 425,000 fresh infections with syphilis yearly. Measles is the only reportable disease that leads it. Syphilis is rated among the first four of the killing diseases, but in the meantime it leaves a trail of suffering, misery and disaster, not only among the guilty, but also among the innocent victims who represent approximately forty per cent of the infected. One hundred times as many children died in Massachusetts of congenital lues in the past ten years as died of infantile paralysis. We are paying a big price to entertain this unwelcome guest.

Syphilis is not a rare disease by any means and also let me try to impress upon you that the *Treponema pallidum* is not a respecter of high social or financial position, but that syphilis runs fairly evenly through all the strata of society proportionately. There is no one here who has not seen all too many of the tragedies of late syphilis, which in the light of our present day knowledge of the treatment of syphilis, should become almost a thing of the past. There is a woeful dearth of information of the truth about syphilis on the part of the public, but we must also admit that the doctors have not been wholly without fault. In fact, Dr John H Stokes frankly accuses the doctors of being

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†Sullivan, Edward Copping—Director Venereal Disease Clinic, Springfield Hospital. For record and address of author see This Week's Issue, page 362.



the chief offenders. We must leave the function of the education of the public in matters of sex hygiene to the proper organizations, but we have no alibi at all for the rôle we are playing, or rather not playing, as individuals toward the control of this greatest scourge of mankind.

When we consider what has been done in the control of tuberculosis, it is astonishing that so little has been done about syphilis. There is no serious disease in which adequate treatment presents more striking results. There is no field in preventive medicine which offers greater hope for the practical eradication of a disease in a single generation, and there is no field in which less is being accomplished. Some of this fault must be placed on our shoulders and, if we are to retain our place in the public esteem we must exert ourselves to bring about a better understanding of syphilis and be leaders in the dissemination of that knowledge rather than to procrastinate further and eventually find ourselves in the untenable position where the public knows more than we do, and the public is becoming eager for that knowledge. A few months ago a New York paper was the first newspaper in the United States to publish a series of articles on syphilis. It took courage on the part of the editorial department not to "offend" the readers of this periodical. The demand was so great that reprints were later printed in pamphlet form and of these hundreds of thousands have been sold. Apparently the public is not so easily "offended" as the publishers have formerly thought.

Let us take stock of our mistakes of the past. The first is errors of early diagnosis. The average doctor is apt to regard the genital sore all too casually and make an "eve diagnosis" that it is nothing, or a chancre. Either one is eminently unfair to the patient. If it is syphilis the patient needs a lot of treatment, and if not it is unjustifiable to place the patient in the position of taking the treatment for syphilis, not to mention that you have placed the stigma of syphilis in his mind forever. The days of "guessing" what the genital lesions are, have gone by. All genital sores should be regarded as possibly luetic until it is proved that they are not. The old textbooks have beautiful pictures of the various types of chancres and elaborate descriptions on how to differentiate them and the nonluetic lesions, but not the keenest diagnostician of the past can compare with the modern dark field examination. The diagnostician was frankly making a guess and had to await the appearance of the secondary manifestations to clinch his diagnosis while the dark field is an accurate and rapid method. "Guessing" is as antiquated as kicking your tires to estimate the pressure.

The dark field is a fairly simple procedure

in the hands of one trained to its use and an exact diagnosis can be made in a few minutes. If the treponema is present in the lesion it can usually be found the very first day. Waiting for a Wassermann is never a substitute for the dark field as there is too much valuable time wasted. The most important thing from the patient's standpoint is to have a diagnosis made at once and adequate treatment started in the seronegative stage, as then he has almost one hundred per cent chance of cure. From the appearance of the chancre to the time the luetic is put under treatment is the most important period of his life, so far as his future health is concerned. If he reports to you early why not give him that opportunity to safeguard that health and not throw away a lot of his chances by ducking the issue. This is said with due regard to the general opinion that the patient with secondary signs or symptoms has a better chance than the patient put under treatment in the so called seropositive primary stage.

Also let me implore you not to put any mercurial on a lesion if you are going to refer the patient for a dark field examination. The treponema cannot be found in the lesion for from twenty-four to forty-eight hours after a mercurial is applied. The mercury has no beneficial effect on the lesion and you are forcing the operator to the trouble of getting his secretion for examination from the inguinal glands. A chancre *per se* is not a disease it is only a symptom that the patient has a general infection with syphilis.

I wish particularly to stress the fact that we do not inspect our cases of gonorrhea with enough thoroughness. We see quite a number of cases of late syphilis in which there is no history of chancre but only one of gonorrhea, and I mean in patients who are doing their best to be truthful and co-operative. Every case of gonorrhea follows an exposure that has also the potentialities of infection with syphilis. There must be a not inconsiderable number of cases of gonorrhea in which the luetic infection takes place at the same time and is unobserved. If one would be on the alert for the intra-nrethral chancre and not lightly dismiss slight lesions of the glans penis and coronal sulcus in gonorrhea there would be more cases of syphilis discovered early instead of late. I believe that all patients with gonorrhea should have a Wassermann done before dismissal and what I truly believe to be better routine is that they should have a Wassermann at the first visit as well. Then if the later Wassermann is positive, you know whether you are dealing with an early or late syphilis which is not always so easy to differentiate in asymptomatic syphilis.

Cases of chancroid which by the way are not common in this section of the country after repeated negative dark fields should have a



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## THE DOCTOR AND EARLY SYPHILIS\*

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THIS paper is rather elementary in its scope, but at times it is well to get down to fundamentals and review what we know, what we should know, what advances have been made in some particular field, and analyze our mistakes of the past in order that we may more ably conduct ourselves in the future. It is addressed especially to three classes of erroneous thinkers: those doctors who believe that when the objective symptoms disappear under a little treatment the patient is cured, those who believe it is a hopeless situation at the best, so what is the use, and those who believe that their clientele is so fine, or refined, and syphilis such a rare disease there could be none of it among them.

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part as it still ran on like the babbling brook, unrestrained, until most recently. If we take into account the difference in the communicability of tuberculosis, diphtheria and typhoid, as compared with syphilis, there must be some answer as to why the latter has thrived all these years. There is an answer and a large proportion of it is a quite simple one and may be summed up in lack of education of the public, and lack of education of the doctors.

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is the one used in this state. It is the continuous pounding away with treatment within the limits of the patient's tolerance that offers the best possibility of curing the disease. Let me interpolate at this point that a human being as well as a disease is being treated. There are no half-way measures that are of any use and there is no substitute for arsenic in rendering the patient noninfectious early and in the ultimate cure. It makes little difference what brand of arsenical you use or what preparation of bismuth even though the salesman assures you that his house makes the best, and subtly or not too subtly infers that you must be a congenital idiot if you do not use his. I repeat, it is the amount of steady regular persistent treatment that counts. After the period of treatment is finished the patient should be kept under observation for at least five years and maintain a negative serology.

In the past year, I have been using a new preparation of arsenic, mapharsen, and am impressed with the results in a series of selected cases of early syphilis. It is well tolerated, does not cause the reactions so often seen with the older forms of arsenic, cleans up the skin lesions and brings about a reversal of the Wassermann with about the same speed as the old arsphenamine. What was of especial interest to me were the results attained in four cases of interstitial keratitis at the Springfield Hospital clinic. In each case the improvement in the eye condition was most gratifying in that the pain and discomfort were gone after the second injection and the congestion was much less. One case did develop a slight involvement of the other eye after eight injections. No one needs to tell me that four cases do not constitute a proved series any more than one swallow makes a summer, but when one looks back on the discouraging results in this condition with the other forms of arsenical therapy in the past even four cases give me some hope to believe that this drug may be of decided value.

What does the adequate treatment of early syphilis promise to the patient? It is the adequate treatment of early syphilis that reduces or eliminates the later ravages of syphilis with which we are all familiar. In the survey made by the United States Public Health Service it was found that cases of neurosyphilis had, in most instances, been very inadequately treated with arsenic, and most of them had received little or no heavy metal. Their conclusion was that neurosyphilis was three times as common in those who had received "little" treatment as in those who had received "much." Early mucocutaneous relapse was seven times as common under like conditions. Late syphilis as relapse was entirely absent in the group which had received "much" treatment. In a later report published in April 1936 it is stated that

it is apparent from the studies made by the service of a large series of cases that the patient adequately and regularly treated for early syphilis will be almost exempt from cardiovascular involvement later. In respect to these conclusions it should be noted that what they call "much treatment" consists of twenty, or slightly over, injections of arsenic and forty to fifty injections of bismuth. I believe the thirty to forty arsenicals and sixty to one hundred bismuths paint a better picture in end-results.

Perhaps all pregnant syphilitic women do not come under the classification of early syphilis, but the syphilitic baby most certainly does. It is an established fact that the luetic mother put under treatment by the end of the third month and treated throughout the pregnancy will, in most instances, produce a healthy child. All pregnant women should have a Wassermann early in each pregnancy and if found positive, or known to have syphilis, be put under treatment. And doctors fear that their more affluent patients may be insulted if they suggest a Wassermann. It would be far kinder to insult them with a Wassermann early than a luetic child later. The poor are more fortunate as they go to a prenatal clinic where the Wassermann is routine.

#### SUMMARY

Syphilis is not a rare disease and no one is immune.

The dark field should be made use of much more frequently as a means to an early diagnosis.

Every case of gonorrhea, or chancroid, should be examined for the possibility of mixed infection with syphilis.

Early intensive and continuous treatment renders the patient noninfectious and hence prevents the spread of syphilis.

Adequate treatment will probably reduce the incidence of neurosyphilis to ten per cent of its present prevalence.

Adequate treatment will probably almost eliminate cardiovascular and other late forms of syphilis.

Congenital syphilis is nearly an inexcusable disease.

The doctor has a most decided responsibility to his patients with early syphilis. Will he accept it?

#### DISCUSSION

CHAIRMAN TOWLE: This paper is now open for discussion.

DR. N. A. NELSON (Boston): It seems to me that Dr. Sullivan's paper has this particular value—that it calls the attention of this group of dermatologists and syphilologists to a situation with which Dr. Sullivan has been constantly impressed during his 18 or 20 years at the Springfield Clinic. You know as well as he that patients come to the attention of syphilologists and clinics whose infec-

series of Wassermanns over a period of four months as it is not rare to have an infection with the treponema as well as Ducrey's bacillus

In the past fifteen years there has been an increase in the number of extragenital chancres, and here again the doctor is not of a sufficiently suspicious frame of mind. The "cold sore" on the lip which is not typical, is indurated, and shows no signs of healing should be regarded with suspicion. Sores inside the mouth on or beneath the tongue, or on the tonsils, attended with cervical adenopathy should in many cases be regarded with the greatest suspicion, especially in young people, and resort had to the dark field. The dark field may be done on secretions obtained from the lesions themselves where there is always the difficulty of differentiating the treponema and similar organisms, although most mouth lesions have existed so long that the Wassermann is usually positive and hence a check on error, or what is better, is to take secretions from the cervical glands where the treponema would be the only spirochete present. Many a blunder will be averted if these lesions are not too lightly regarded, and some palliative mouthwash prescribed, only to find yourself deeply chagrined when the patient later develops a distinctive efflorescence of secondary syphilis. Any pharyngitis or laryngitis which persists for several weeks is waving the red flag and begging for a Wassermann.

The primary lesions of the fingers, hands, cheeks, eyelids, and so forth, should in most cases arouse suspicion long before they do. Any sluggish ulcer that is painless, indurated, has no signs of sepsis surrounding it and shows no signs of healing, should give pause for thought that there is such a disease as syphilis. Always look for adenopathy in the satellite glands in suspected extragenital lesions. It is well to remember that only about seventy per cent of syphilis develop a noticeable secondary eruption.

Another unrecognized origin of the late syphilis we see in patients with no exposure of their own, and a proved uninfected family, is undiagnosed syphilis contracted when they were babies or children. There is the possibility that it was kissed onto them by some adoring, but infected, relative or family friend. I would suggest a search for a possible primary lesion and adenopathy in skin eruptions of undetermined nature or in supposed exanthemata in which the skin lesions persist beyond the usual time.

Now let us review the common errors committed in the treatment of early syphilis. If you will form a mental picture, that in a broad sense, the lesions of early syphilis are inflam-

matory in character while the lesions of late syphilis are truly destructive in character, there can be no argument as to when is the best time to accomplish results of a permanent nature. There is no easy road to the cure of syphilis, but it would be impossible to overemphasize the point that it is early, and adequate, and continuous treatment, over a long period, that gives the only chance for the looked for cure.

The patient that is given five or six, or even twelve, injections of an arsenical with the consequent disappearance of the symptoms, and perhaps unfortunately a negative Wassermann, and then patted on the back and assured he is all right and need never worry again, has not received medical service. On the contrary, he has been done a grave injury. I will admit that in the very rare case he may be cured, but it is highly improbable. There are no good, but several bad effects in store for him and his. That patient has been lulled into a sense of false security. There has been turned loose on the community a potential broadcaster of syphilis and the prospective parent of a syphilitic child. That patient will almost surely have a relapse and become infectious again, or later on, some doctor is going to have the problem of trying to patch up a case of late syphilis which result is about as permanent as an adhesive tape repair job. The patient had his chance but it was thrown away.

In the past fifteen years we have had enough experience to establish quite definite criteria as to how much, and how long, the early case of syphilis should be treated. I am speaking in terms of probable ultimate cure and not about sufficient treatment to guard only against later mucocutaneous relapse. The early luetic should receive from thirty to forty injections of an arsenical, and from sixty to one hundred doses of heavy metal, preferably bismuth. This treatment will last from one and one-half to two years, and it is important that this treatment be given without any rest periods. There are several different schemes of alternate arsenic and bismuth, or simultaneous treatment with both and follow-up with bismuth until the required amount is given, but whatever scheme is used there should be no rest periods. It is during the rest periods that the infection has a chance to gather strength again. It is good therapy to give three injections of arsenic the first week.

A Wassermann should be made monthly, and if it remains persistently positive after a few months, in all probability you are dealing with central nervous system involvement and appropriate measures should be taken. It is not common to find central nervous system syphilis in the face of a negative Hinton test which

with a history of thirty or forty neosarsphenamine injections of light dosage in conjunction with bis mntn in some form.

Don't forget the old stand-by mercury in the treatment of syphilis. It still has its place in our armament and a strong one. It will many times come forth in Wassermann fast cases.

I have seen the maternal blood positive while the blood taken from the cord was negative. I can hardly understand that. Perhaps it is a fault of the laboratory.

I remember an instance that happened while endeavoring to ascertain the length of time arsenic was excreted by the kidneys after an injection of arsphenamine. Arsenic was reported in the urine for quite some time. Then the urine of a gonorrheal patient was substituted as control and this urine was returned as containing arsenic. A checking over of the zinc used in the laboratory test proved the source of arsenic. It was found that the urine became negative for arsenic in five to seven days after the injection of arsphenamine. So why not make our intervals between doses from four to six days?

The treatment of syphilis takes time and I feel that progress should be checked by frequent blood tests and if the tests are negative tell the patient it makes him feel better and if the explanation is made plain to him that this negative report is only showing good progress but not a proof of cure. I hardly think many patients will discontinue treatment feeling the disease is eradicated.

THE CHAIRMAN Dr Sullivan will close.

DR SULLIVAN Springfield Many times I have wished that Dr Wassermann had been dropped in the Bay the day he was born or that he had never discovered this test because just as soon as you get a negative blood test they say I don't need any more treatment, and you have to spend hours trying to sell them the reason for more treatment and that a negative blood has very little significance in these circumstances.

As regards the problem of sex hygiene I assumed that everyone realized that while we practice medicine many of us are also associated with the societies that are interested in this other phase of the subject. On this matter of congenital syphilis I wish to tell one interesting case. Of course the Bible says that the sins of the fathers shall be visited upon the children even unto the third and fourth generations and I wish to prove to you that this is not always true. About three years ago

there came to our Clinic a young man with a typical chancre about the size of a walnut of six weeks duration on his lower lip. I accused him of having been exposed to dissolute women but he assured me that he was married. I replied that while I knew that the marriage vows were supposed to act as a moral restraint I had never observed that they were a positive physical deterrent. He maintained that he had done nothing of the kind suggested so I told him that he would have to bring his wife in and he said that she and also a child were with him. After I had started him on his way to treatment I saw the wife and child. The wife was a very good looking and very healthy looking young woman of about twenty-three but in her arms she held the most complete example of a luetic child you ever saw. The peculiar thing about this child was that when the child was thirteen months of age the lesions were the type that is seen in the first two to three months of life and they did not develop until the child was eleven months old. Here was a case where the father had acquired his syphilis from kissing his own child. It was the sins of someone being visited upon the father through the child.

Then I asked this young woman or rather I didn't ask her I told her. It is a mistake to ask them if they ever had it they won't admit it. I said to her a number of years ago when you were only fifteen or sixteen you had intercourse with some man. She said this was true and then I asked her what became of him. She replied that one day he left that small town suddenly and had never been back. That fellow knew that he had acquired syphilis and knew that he had infected her and so he just disappeared. She never had any outward symptoms of syphilis but she did remember that for about a year she did not feel well and that her doctor gave her tonics for anemia. Six or seven years later she married. She had had her syphilis long enough so that she did not infect her husband but when she had a child it was necessarily syphilitic and that child infected its own father.

The point of all this is that if this young woman had a Wassermann when she became pregnant she would not have raised a syphilitic child and imposed the disease upon her husband. Some doctor made three cases of syphilis where there should only have been one.

THE CHAIRMAN Before we adjourn for luncheon let me remind you of the round table discussion.

(The Section then adjourned.)

tions with syphilis have been misdiagnosed, mis-treated and mishandled generally by the physicians who had previously seen them

It seems to me that a special committee could be appointed by this Section whose duty it would be to prepare material to be published in the name of the Section for the purpose of teaching physicians, in general, how to manage syphilis. I am of the opinion that such a group as this should be teaching obstetricians, for instance, that the treatment of syphilis in pregnancy is essential to the prevention of congenital syphilis should be teaching pediatricians that there is such a condition as congenital syphilis, and should be teaching that the treatment of any form of syphilis is a part of the practice of medicine

There are reported annually in Massachusetts more than 5000 cases of syphilis. Approximately a third of the cases reported are in the primary and secondary stages, that is, nearly 2000 early cases. There are approximately as many cases of congenital syphilis reported annually as of diphtheria although syphilis is very poorly reported and diphtheria very well reported. The prevalence of infantile paralysis, which gets double headlines across the page whenever a case appears, is nothing as compared with the prevalence of congenital syphilis

I bring to you the challenge of the American and Massachusetts Neisserian Medical Societies which are attempting to teach the physicians of the United States and of Massachusetts something about the management of gonorrhea. There is most certainly a similar problem to be solved in the control of syphilis, and if advice and information and assistance are to be made available to those physicians who know little about the disease or its management, it seems to me it ought to come from this group

(Dr Austin Cheever commented on Dr Sullivan's paper and cited his experience with two cases)

DR JOSEPH MULLER Dr Sullivan's most admirable paper certainly was a challenge to us. We bear down in this State rather on tuberculosis but we don't do anything about syphilis. Now I was educated and started my work in a country which did cur syphilis. Due to their poverty they couldn't do anything with tuberculosis. Their death rate is the same as it was in 1900 but at the same time they did see the challenge of syphilis, and they have made wonderful strides combating it. They brought the study of syphilis into their medical schools as a major subject. It was easy for all medical schools supported by the State. Where there is compulsory reporting of cases with the name of the doctor who treated each patient treatment is enforced. So the syphilis rates are coming down. Every one of us could bring up dozens of cases like Dr Dennie did and it is remarkable how often they are from the best families as considered by the profession

DR LANE I commend Dr Sullivan for urging very plainly this question of early syphilis. I endorse all that he says in regard to early diagnosis and early treatment and I think his discourse should have widespread distribution. He suggested leaving the matters of sex hygiene and so forth to the public authorities. I think that all doctors and dermatologists in particular should also participate in this field not only to distribute information among other physicians but also to the public as well. I think that is something for the whole medical profession to participate in. The matter of early diagnosis is of course absolutely essential and the simplicity of dark field technic and the need for

doing it universally cannot be emphasized too often

I also endorse what others have said in comment about the Wassermann. I think that perhaps the too frequent Wassermann is a highly dangerous thing. The less frequent Wassermann is probably of advantage in numerous ways. I was very much interested this last week in a paper concerning something which I think many of us fall in, and that is the matter of epidemiological study of our cases. I think we should at least institute it, if we ourselves do not make an epidemiological study of our cases. That was emphasized very well in a recent paper in regard to the epidemiological study and a description of some of the cases by Dr Dudley Smith of Virginia by means of charts and work which he has done. It was surprising to find the contacts which he had been able to discover. Doctors do however see the original sources but perhaps there are three or more contacts and these contacts have several contacts apiece from which to trace the secondary sources. They go back perhaps through three or four generations of contacts. In one of his charts he showed fifty exposures which had been obtained from one patient, and one of his charts went back through one hundred different contacts which he was able to trace down and observe in the course of his study of an individual case

It has been regrettable to many of us that at Harvard they have cut down the number of lectures in dermatology and syphilis to five expecting the student to be taught a knowledge of dermatology and syphilis in that length of time plus perhaps ten sections of the Clinic work. Of course some syphilis is given in medicine, but no other teaching so far as I know, covers the subject of adequate diagnosis of early cases. I hope that sometime we will be able to rectify this state of affairs

DR G A DIX Worcester I cannot resist the temptation of saying a word about the matter that Dr Lane brought up and that is the social education of the early patient with syphilis. Now I cannot make myself feel that it is the business of either the Board of Health or the social worker to go into that. They may know some parts of it, but not all. When it comes to a case of telling patients about marriage for instance and about their other social and industrial contacts we know more about that than the Board of Health and social workers do, and it is our duty to teach these people, what they are to expect from the disease and how to protect their associates. We talk a great deal, one to another and in papers about the proper scientific treatment of syphilis. But I sometimes think we don't tell one another enough or teach our students enough about the natural history of the disease because really that is a very important part of treatment. The medical treatment of syphilis is not very difficult nor its special type so particularly important, but the social management of it is of decided importance

DR ROY H PECK Springfield It was with great pleasure that I listened this morning to my old friend and hated rival in Springfield and perhaps I enjoyed his paper more because I certainly agree with him

In the diagnosis of syphilis by inspection of the initial lesion or so-called chancre we find it may take any form and we don't expect always to see the clinical indurated sore of the textbooks. I have seen what appeared to be a simple balanitis show a dark field positive for syphilis. The only typical chancre is a lesion showing *Treponema pallidum*

Many times I think that we give too small doses of arsphenamine and this results in a fast for arsenic. Too many Wassermann fast cases are seen

children and grandchildren, and from this experience to acquire facts that were valuable to him under certain conditions of disease. But under the modern conditions of easy, rapid transportation, telephones, hospitals and the vast increase in medical knowledge, the public does not pin its faith on any one man. The family physician's place has been taken by the general practitioner, who is, or should be, a diagnostician, and capable of guiding his patient in serious or unusual illnesses to various specialists, and capable of evaluating the various opinions rendered by them. There is a common saying that 80 per cent of sickness can be diagnosed and successfully treated by the general practitioner alone, but obviously this means the vast number of minor ailments that recover quickly, for the majority of severe illnesses are treated in the hospital, where the patient can have the advantage of group conferences, laboratory, x-ray, and so forth.

The hospital is the most remarkable institution that organized medicine has developed for treating the sick,—one might say that the hospital is medicine, actually it is an institution in which the patient is assured of the best treatment available, at the same time it affords the doctor an opportunity for case study, and conferences with his fellow staff members that result in educational advancement to himself.

Under the wise guidance of the American College of Surgeons the hospital has become an established factor in the community, which the average citizen accepts as a matter of course much as he does his other civic privileges. The family physician of a few years ago did not care whether he had access to a hospital or not while today people look to the more or less closely connected group surrounding the community hospital for their medical care. No one wants to practice surgery or medicine who does not have access to a hospital, and the nearer a doctor can limit his practice to hospital and office, the more fortunate he is. Incidentally the hospital enables the general practitioner to become a part specialist. This is an important thing, for every general practitioner should strive to know some branch of medicine better than others. He should excel in some one subject, for the field of medicine is so vast and so complicated, that no one can hope to excel in all branches.

But is obvious that the hospital and its advantages have added to the cost of sickness. This might not be so if the patient would be contented to accept his care on a necessity basis to eliminate luxuries and consider essentials only. But we find that the "keeping up with the Joneses" attitude exists here even more than in other walks of life. Expensive rooms, too long a stay, private nurses, where a ward bed only

is indicated, and the employment of costly and unnecessary methods of diagnosis.

The essentials in a hospital are about as good for the poor as the rich. I have never found any great difference in the mortality rate of the ward and the private room. The objection to the ward is the lack of personal privacy, noise, visitors, and talk from other patients. Improvement in hospital construction, according to C. L. DeMerritt, in the *Atlantic Monthly* for April, 1936, would be the construction of very small rooms, or two or three bed wards, that could be let at a reduced rate, and thus overcome the objections to the open ward as listed above.

Many patients leave the hospital with empty pocketbooks, and even in debt to the institution itself. Of necessity they either ignore the doctor's bill, which is usually very small in comparison with the hospital charge or put off the payment of it to the distant future.

#### GROUP HOSPITALIZATION

One out of every fifteen requires hospital care every year. That involves one-half the cost of medical care for the entire family. Sickness is a thing that the family never provides for in its budget.

The greatest cost of sickness comes from cases involving hospitalization. It is obvious that hospitalization is a necessity in many cases. This being admitted, it would seem that the most practical way to reduce the cost of sickness is to reduce the cost of hospital bills.

The plan of Group Hospital Insurance was presented to you some two years ago by Dr. Metcalf, and was officially approved by the House of Delegates last year. Since then it has been studied and practical details elaborated by the Committee of Hospital Superintendents, Mr. James A. Hamilton, Chairman. The Committee thinks well of the plan and believes that it should be put into operation. This is no experiment. It is successfully operated in many places in this country. It has been found that the plan succeeds best in thickly settled communities, where there is a considerable cross-section of the population to enroll. So, in recommending the same for New Hampshire with its small population, I believe that group hospitalization, if adopted, must be inaugurated voluntarily by a few hospitals in different cities and towns as a purely local enterprise. If the scheme works out well, hospitals in other cities and towns will gradually be forced to fall into line, so that group hospitalization will eventually become more or less statewide. I believe that this plan is the most practical that has so far been offered to reduce the cost of sickness to the low income group. I would recommend that effort be made to put this plan into operation in the early future.



## NEW HAMPSHIRE MEDICAL SOCIETY

## THE PRESIDENT'S ADDRESS\*

BY CLIFTON S. ABBOTT, M.D.†

IT is an established custom of this Society to listen to remarks from its President at this time on matters that he deems important for the good of the Society. The Society is a democratic body with functions both educational and economic. The function of its meetings have always been primarily for the discussion of the scientific phases of medicine. But of late years the economic stress of the times should necessitate some considerable time being given to the discussion of matters relating to social and political economics either in the meetings of the House of Delegates or in the open meetings of the Society.

There is no doubt but that there are many people in the low income groups too prosperous for relief, but who are unable to budget their affairs so that they can meet emergencies when they arise. They delay in seeking surgery, and take serious chances with disease that may endanger their future health to an extent that is beyond recovery. A serious illness can easily take a heavy toll from one's bank account, and if the bank account has been depleted by supplementary low wages and short time employment, as well as by living expenses, a severe illness will leave the family badly in debt. This condition confronts so many individuals and families that there is ample excuse for them to seek more economical medical service. Economical medical service will have to be good service, however, or it will become most expensive, and a menace to the welfare of the community itself.

As far as actual happenings having occurred, this has been a quiet year, but we have plenty of evidence that the present plan of practicing medicine is being studied, evidence collected, and facts evaluated by lay organizations, with the altruistic claim of improving our medical service to the sick, which to them means insurance under federal control. It is claimed that since the economic depression, while the same high standards of medical practice exist, there are more people unable to pay for it, or more people that will require a long time to pay for it, so that the study of this phase of medical practice is an entirely proper thing, for it is universally admitted that there can be no prosperity of nation or family without good health.

The basic principle that must be borne in

mind is to provide adequate and skillful medical care for all the people at a price that they can afford to pay, and at the same time to secure for the doctor an income that will enable him to keep himself professionally progressive and physically fit.

The medical profession should not leave the study of its activities and the furtherance of plans for improvement to lay bodies alone, but should, with open mind, study the situation themselves, for if it is true that a man thinks clearly only in the line in which he has been trained, the doctor should be able to plan the solution better than anyone else.

The doctor has a bad reputation as a business man, but he is improving. There are capable business men in the profession.

In applying this discussion to New Hampshire, the industrial sections of the State have suffered from poor business and consequent short time employment and low wages, resulting in many people with badly depleted bank accounts, and more on relief.

The American Foundation asks us if we think any radical change in the present system of the practice of medicine is necessary or desirable in New Hampshire. Here the greatest part of the work of caring for the sick is done by the general practitioner, and all of the surgery and the majority of the cases of severe illness are cared for in hospitals.

The people of New Hampshire are hospital-minded. More and more the hospital is being utilized. This is shown by the fact that New Hampshire has thirty-eight hospitals, well distributed over the State, twenty of them are approved or provisionally approved by the American College of Surgeons. The hospital offers facilities for diagnosis and treatment of disease that cannot be duplicated in the home, and is of mutual benefit to both doctor and patient.

We are living in a time when rapid changes occur. We have to keep alert and attuned to them or we find ourselves out of sympathy with conditions. It is said that prior to 1870 changes took place very slowly, and since then there has been an ever-increasing rapidity of change in customs and thought. Medicine is bound to change with other customs.

The family physician in the true meaning of the term is nearly extinct. It is unusual for a doctor to have a whole family that he can depend upon for patronage for any length of time, while some years ago it was not unusual for a physician to care for the family, their

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mind as a possibility. A great deal has been written on this subject during the past months but it has been too often presented from the standpoint of hospital diagnosis and therapy. The contention of this review is that if recognized and treated early the irritable colon can and should be handled adequately by the general practitioner in his office.

Colon difficulties are common and of all the colon ills, the one discussed in this paper is the most common. Approximately four per cent of the patients treated in my office during the past two years have had irritable colons. If you stop to consider the various complaints including everything from a common cold to advanced carcinoma which bring the patient to the office of a general practitioner you will probably agree that four is a percentage high enough to make the condition warrant consideration. Its prevalence has been recognized in reports in the literature. Jordan and Kiefer<sup>1</sup> find that thirty per cent of three thousand admissions to the Gastro-Intestinal Service of the Lahey Clinic were proved cases of unstable colon. A large percentage of patients who come to the physician's office with vague abdominal symptoms associated with a neurosis who are given some type of pill and sent away, could then be greatly relieved if properly treated for irritable colon.

As stated above most of the attention which has been called to the subject has been along the lines of hospital treatment and therapy. The case which reaches the hospital or large clinic is as in all other conditions, usually more advanced and of longer standing. We are emphasizing more and more the importance of early diagnosis and preventive therapy in all pathologic processes. Why should it not be of just as much importance in this condition as it is one which is so common and one which is apt to progress if not treated intelligently? Because of the etiologic factors associated with the disease its early diagnosis and treatment seem to be most important. It appears to be generally conceded that there are two very important factors in the production of this disorder namely the neurotic background and the cathartic habit. Probably the more important is the neurotic background.

Eggleston<sup>2</sup> concludes that the unstable nervous system is the most prominent etiologic factor. Laus<sup>3</sup> describes a so called irritability threshold determined by the individual's make-up and exaggerated by irritants. Jordan<sup>4</sup> also finds a very definite relation between unstable colons and a neurosis. There is a tendency to a nervous imbalance in the individual which is exaggerated either by psychic or physical irritants.

The most important physical irritant is the cathartic. The cathartic habit is the result

largely of pernicious advertising which as Huist<sup>5</sup> aptly expresses it "accuses the colon of ills it never commits" and the result of mass suggestion from constant reading about the disastrous effects of intestinal intoxication is that most of the lay public and many of the medical profession join in the slander. The already unhappy colon is whipped into an enraged and stubborn state. If the case is allowed to progress untreated the digestive and bowel distress may cause a neurosis and constipation which following the taking of cathartics, create vicious circles which tend to make the case much more intractable.

As to the method of diagnosis the most important conditions are the history and evaluation of the patient's general make-up. Physical examination is of some help and laboratory examination is of great help if it can be employed. However as this is a condition so universal and as many practitioners have not the advantage of x-ray equipment, I would like to call attention to the fact that although the x-ray is an invaluable aid in diagnosis it is not essential. Almost all articles in the literature make the statement that every case should be thoroughly x-rayed. I feel that this is true certainly of hospital practice, because in most of these cases symptoms are so advanced that an x-ray examination is necessary in order to rule out associated conditions, particularly the malignancies. However if a roentgenographic examination cannot be made the physician should recognize and treat the condition intelligently rather than give cathartics and thereby aggravate the symptoms.

As we know the colon is innervated by the two parts of the autonomic nervous system. The parasympathetic originating chiefly from the cranial nerves, has a pressor action upon the intestinal tract, and the sympathetic originating from the spinal nerve roots has a depressor effect. These two systems are very delicately balanced and this balance is quite easily upset in the individual of unstable nervous tendencies. The disturbance of this balance produces the syndrome exemplified by the patient of unstable nervous make-up who gives a history of constipation or diarrhea, vague abdominal discomfort or pain associated with gaseous distress. In more extreme cases nausea and vomiting and often anorexia and loss of weight occur. The symptoms which brand the patient as being one of those individuals of unstable nervous balance are too legion to be enumerated, among them however may be mentioned vertigo, depression, headache, fatigability, insomnia, irritability and palpitation. Another point which has I think not been stressed enough is the fact that a large percentage of these individuals suffer from attacks of migraine. This headache is quite apt to occur in the early

There are many other plans and experiments being conducted by medical societies in various parts of the country

The treatment of patients by groups, so formed as to cover the various specialties, saves duplication and the overhead is estimated to be reduced about 20 per cent

There is a plan in operation in Washington, D C, that has the enthusiastic support of the medical society of that city, and is being adopted in some other large cities. It would not be practical, without considerable modification, in small cities and rural communities

This plan co-ordinates the medical resources of the District of Columbia, doctors, hospitals and dentists, with the aid of the Community Chest for the purpose of making adequate medical care available to all that need it at a price that they can afford to pay. This recognizes three major situations—1 The care of indigents 2 Cost of hospitalization and nursing to nonindigents 3 Payment of medical services by small wage earners

1 The sponsors believe that the care of the indigent is a local obligation, state or county, not federal

2 The cost of hospitalization and nursing is met by a group hospitalization plan

3 Payment by small wage earners is arranged through a bureau called "The Medical and Dental Service Bureau." Here the budgeting of the doctors' and dentists' fees is done. Arrangements are made by the Bureau in accordance with the finances of the patient as mutually agreeable to both patient and doctor

We cannot deny that there is a great interest in socialized medicine in this country. Sick-ness insurance has been in force in leading European countries for some years. The coverage in England is limited and restricted to the lower scale of wage earners, while that in Germany is a very complete coverage. I understand that the German plan is the one in favor with those that are back of the movement in this country. There is a well-founded objection on the part of American doctors toward compulsory health insurance. This is based on the knowledge that where this has been tried it has not worked out to the advantage of the

doctor, or resulted in a better grade of service to the sick.

Medicine, under state control, has many features that make the thoughtful man wish to avoid it

Looking at the situation from a different angle, as a matter of the prevention of disease, the Committee on Legislative Activities of the American Medical Association suggests

"The social aspect of sickness connotes the broader problem not entirely medical. Adequate income provides for normal living and working conditions, and a reserve for emergencies

"Insufficient income and unfavorable employment conditions reduce the family to a poor living level, with insufficient food, inadequate clothing, unhealthy housing, bad psychogenic states. Subnormal health follows, less effective work is a consequence

"Sickness especially disabling, as tuberculosis, heart disease, arthritis, is much more frequent as a result of the above conditions

"Absence of a reserve necessitates frequent expensive care in public institutions. Disability creates partial or complete dependency

"Medical care cannot elevate the individual to normal health and effective work when unfavorable living conditions make this impossible

"Sufficient income for normal living to reduce sickness would be more effective than a few weeks of medical service after chronic disease and permanent disability are established"

If our well-wishers, the Government, sociologists and philanthropists could stimulate business to an activity where there was a real demand for labor, with high wages, the purchasing power of the masses would be restored, and the problems incident to poverty would cease to be troublesome. If it is necessary to change or modify our present plan of practicing medicine so as to distribute the cost of medical care from the individual to the group, the plan should be in charge of the medical profession. If economic conditions do not improve, it is apparent that some change will have to be made. The matter is of enough importance to merit your thoughtful consideration

## THE IRRITABLE COLON DIAGNOSIS AND TREATMENT BY THE GENERAL PRACTITIONER\*

BY J DUNBAR SHIELDS, M D †

THE purpose of this discussion is to emphasize the importance and prevalence of the condition, "Irritable Colon," to call the general practitioner's attention to the necessity of recognizing and treating the condition in its early

stages, to make some suggestion as a means of diagnosing the condition without the help of elaborate laboratory apparatus, and to offer a method of therapy applicable to ambulatory office practice

We are considering a very common condition which, although often unrecognized and therefore often mismanaged, is easily diagnosed if the physician will only remember to keep it in

\*Read at the Annual Meeting of the New Hampshire Medical Society at Manchester May 26 1936

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never formed a regular bowel habit routine. They have for a long time neglected the reflex stimulation of a full rectum, thus lowering the threshold to such a degree that they do not respond to this normal stimulus. The formation of a regular bowel habit, as explained in the third instruction, is of great value to these people.

The diet list is quite an important feature of the treatment. It is made up of nonirritating, low residue foods with the idea of producing as little irritability of the bowels as possible. I begin with a strict bland low residue diet with vegetables puréed.

The use of belladonna seems to be quite rational in that its action in paralyzing the parasympathetic nerve endings is of great value in correcting the imbalance which exists between the parasympathetic and the sympathetic divisions of the autonomic nervous system. I go on the theory that different patients exhibit different tolerances to the drug and therefore start on a small dose, increasing it until actual physiologic effect is obtained. There is another reason for giving belladonna, and that is that when given in large enough dosage, it also has a tendency to increase thirst, and therefore facilitates the intake of water.

Some authorities will disagree with me in the use of the mineral oil psyllium seed mixture, saying that mineral oil has a tendency to be a bowel irritant. I have not found this to be the case when used in the above dosages. In office practice where it is not possible to check up on the patients as to the taking of enemas or laxatives, it is important that we get immediate results. If the patient finds that he has no bowel movements after a period of three or four days he will most probably turn to some type of laxative. By giving parapsyllium, this danger is partially removed. It is my practice to reduce this dosage within a period of four days, and continue gradually to reduce the dosage so that within a period of ten days to two weeks it becomes unnecessary for him to take this medication. It is found that, after suddenly reducing the bulk of the diet, as is done when the patient is put on a low residue diet, there is not sufficient bulk in the intestinal tract to produce a normal bowel movement. The parapsyllium is given with the idea of making up this bulk in a bland nonirritating mixture. As the dosage of this is reduced, the bulk is gradually made up by adding slightly more residue to the diet in the form of lettuce, celery, and stewed fruits. As the case progresses, the diet is further changed by the addition of vegetables of higher residue or by the discontinuation of the necessity of using purees.

The seventh instruction as to relaxation is very necessary. In hospital practice this is taken

care of by bed rest. In treating the ambulatory case, the actual rest in the middle of the day seems to be of great value in reducing the accompanying nervous tension.

In some cases it will be found that the patient does not immediately respond to therapy and that the bowel movements are unsatisfactory during the first week or two weeks of treatment. The use of the cotton-seed oil rectal instillation often facilitates a normal bowel movement without producing untoward irritative effects.

Of course there will be many cases met with that offer individual problems and the care of which necessitates individual changes in the above therapy, but, as a general rule, the above therapeutic plan will fit every case with minor changes. This plan of therapy has been of great help to me and has almost unfailingly produced excellent results. No group of patients has been more appreciative than have these colon cases.

**Summary** 1 The condition, irritable colon, is a very common one in office practice. 2 Diagnostic suggestions applicable to general office practice without elaborate laboratory apparatus are presented. 3 A method of therapy which I have found to be of great value is discussed in detail.

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#### DISCUSSION

**PRESIDENT ABBOTT** The discussion of this paper will be opened by Dr Clarence O Coburn of Manchester.

**DR. CLARENCE O COBURN** I think that Dr Shields' paper is very opportune. In fact my experience during the past four or five years shows that this condition is becoming more prevalent than I had noticed before. Perhaps I was not so keen on making the diagnosis previous to that time but it seems to me that it is mostly due to the stress strain worry, hurry and the methods of modern life caused partly by the depression.

I think another element that enters into the situation is fear. People nowadays have the phobia because of radio and newspaper advertising.

Another thing that produces fear and worry in these cases is the idea many people have gained from literature and faddists that they should have five or six movements a day and that if they don't they will get intestinal toxemia. I think that bugaboo has been played to the limit. My experience has been that those who have one normal movement a day are much more healthy than those who have two or three.

morning, in fact the patient usually awakens with a headache which is often associated with nausea and vomiting. Kiefer<sup>6</sup> has called attention to this, saying that migraine is frequently associated with constipation, and although the migraine patient may or may not correspond to one with the typical type of spastic colon, the association is too frequent to be merely coincidental.

Physical examination sometimes reveals tenderness over parts of or the entire colon. Occasionally a rope-like sigmoid may be palpated. Other than these findings, the physical examination is valuable chiefly in ruling out other disorders.

We will not go into the x-ray findings. Suffice it to say that the barium meal and barium enema give interesting and valuable diagnostic aids.

As to treatment, I would like to emphasize first and foremost that as the two most definitely established etiologic factors of this condition are nervousness and bowel irritants, the treatment should primarily attack these two causative factors.

Dunham<sup>7</sup> states in speaking of mucous colitis, which is so often associated with this condition, that re-education for the purpose of drawing the patient's attention away from the bodily functions is the *sine qua non*. Unless the patient can be made to understand that he has no serious organic disorder and that his disorder is curable largely by his own effort, your psychotherapy will be unavailing.

I usually, in the beginning of the treatment of these cases, plan to give at least one half to one hour's "pep talk", during which time I first emphasize to the patient that there is no indication or evidence of severe organic disease. I consider this first step to be of utmost importance. Next I try to give him some idea of just what his condition is, even explaining in most cases by diagram the nervous control of the intestinal tract, and then I emphasize the importance of not distributing this delicate nervous balance. This explanation usually does two things: it obtains the patient's confidence by showing him that you do not consider him a faker or malingerer, and, secondly, it proves to him the inadvisability of the prolonged use of cathartics. I next emphasize very completely to the patient that his habit of taking laxatives, which may run back over a period as long as fifteen years, must be stopped completely and abruptly. To do this it is necessary, as stated above, to show the patient why, and it is also necessary to convince him thoroughly that bowel movements are possible without cathartic stimulation. This is usually much easier than it would appear.

Psychotherapy along general lines is inval-

uable. Teaching these people how to live and how to control the emotional imbalance and the removal of all possible emotional irritants is important. It is sometimes possible practically to cure cases with this alone.

Although these psychic problems are of utmost importance, habit formation, diet, and some medication are invaluable. I have adopted the plan of giving the patient numbered written instructions to be followed implicitly. For the sake of brevity I will give these now, and they will be self-explanatory. They are as follows:

- 1 Take no enemas or laxatives
- 2 Drink two glasses of warm water at bedtime and two on arising, and drink as much water both with and between meals as possible
- 3 Establish a definite bowel habit by going to the toilet immediately after breakfast every morning and remaining there for at least twenty minutes regardless of whether the bowels move
- 4 Follow the diet list carefully and report in one week for a change in diet
- 5 Take fifteen drops of tincture of belladonna in one quarter of a glass of water, increasing one drop per dose each day until symptoms of dryness of the mouth or dilatation of the pupils occur. If these occur, report back for change in dosage
- 6 Take two teaspoonfuls of parapsyllium (white medicine) every morning and every night until a change of dosage is ordered
- 7 Arrange your activities so that it will be possible to get at least forty-five minutes complete relaxation in the middle of the day. By this I mean lying flat and as relaxed as possible on a bed or couch
- 8 Purchase one pint of cotton seed oil, and if bowels do not move during the day, instill one half a glassful of warm oil into the rectum before retiring and allow it to remain until morning

After giving the above instructions it is a very good idea to discuss them individually with the patient, for instance, it is quite necessary to explain to them that it is possible for them to get along without the use of enemas and laxatives. Unless this is very forcibly impressed upon their minds they will continue in the cathartic habit.

In the second paragraph of these instructions emphasis is laid upon the drinking of water. It will be found that a great many of these patients drink relatively very small quantities of water, and the addition of large quantities of water to their diet will in itself contribute toward making the stools much less constipating.

There is a certain per cent of these individuals whose occupation is such that they have

what dilate an irritable intestine which is often spastic. It seems to me the logical way is to get that dry and give the mineral oil to separate it.

One other point to be borne in mind is that you cannot tell all of these patients to drink all the water they can drink they have a mental bias against this. Perhaps you don't meet that trouble outside but I have seen it repeatedly in the hospital.

PRESIDENT ABBOTT Is there further discussion on this paper?

DR. STEVENS of Manchester I would like to say a few words on Dr Shields excellent article from a psychiatric point of view. In a general psychiatric practice we find that almost every neurotic and near psychotic patient has some sort of an intestinal problem. The situation seems to tie up with the inability to make a success at the higher reality level.

If we consider the normal development of the aggressive impulse in each individual we find that in early childhood it flows through in infancy the mouth level and goes on to the bowel level so that the accomplishment of the infant in biting and taking in food at a later date is the accomplishment in the nursery of evacuation. The child comes to learn that society puts a certain value on excretion and the mother is usually very well pleased if the toilet requirements are met.

Later in life of course the aggressive impulse flows over into expressing itself in marriage the birth of children and in the man in the support of his family and the accomplishment of success.

When for any reason the individual fails to accomplish success at the reality level perhaps due to the general depression or due to certain inherent difficulties in his own make-up we frequently find that there is a going back to the bowel level for the purposes of accomplishment. It is as though the individual retreats from a reality level and fixates on the bowel level and at that level tries to solve all his difficulties.

The irritable colon seems to stress more than anything else an inherent constipation tendency which has unconsciously a very strong self preservative value. Now that may sound rather silly but the average neurotic under psychotherapy does place a certain value from the supportive sense on retention and you find growing out of that same tendency the habit of miserliness also the habit of playing the game of life pretty closely. These people are usually very formal they are not generally aggressive and not the sort of people who take a chance.

The constant worry over cathartics of course relates to the social conscience which is against the retention. Most of these cases can be traced back to an overemphasis on the toilet function in the nursery with a mother who was very vigorous in deed in her training methods or else one who was extremely lax.

PRESIDENT ABBOTT Because we are running a little behind our schedule I am going to call upon Dr Shields to close the discussion.

DR. SHIELDS This has been a most valuable and interesting discussion of my paper and I appreciate what has been said very much. It is a subject which is so broad and which takes in so many details that of course it cannot be discussed completely in the length of time allotted here.

There were some points brought out which were of very great interest to me. For instance Dr Coburn's observation that so many of these people have been operated upon has always been of great interest to me because of the fact that we find so

many of them coming in with irritable colons who have had a whole series of operative procedures with a return of their symptoms after discharge from the hospital and not only a return of symptoms but usually an exaggeration of symptoms after each successive operation. That is one of the worst things in the world that we can do for them to increase the psychic and emotional trauma by any kind of operative procedure. That is why the condition should be emphasized more completely and why the medical profession should know more about it.

Dr Coburn also emphasized the fact that you have to treat the patient as a whole that is to take in all of the different reasons why the individual had these difficulties.

Dr Clow emphasized the fact that a high roughage diet and the propaganda put out by the producers of foods have had so much to do with the production of this disorder as well as the propaganda put out by the manufacturers of the different types of candy laxatives and that they have all contributed toward a further irritation of the already irritable colon.

As to the question of why an individual who is not a brain worker has this condition, we do see it probably more frequently in women and we do see it more frequently in the brain worker but I think probably the reason Dr Ager sees so much of it is that he is dealing with people who do not have jobs and who have nothing to do but think of themselves. That is the reason why he finds the condition so prevalent among the men that he sees he has a type of man under his care whom we could expect to develop some condition of this sort.

The question of the choice of medication to give in the way of increasing the bulk of the bowel movements is purely a matter of personal choice. I think anything agar just as well as psyllium seed or any type of mixture used is perfectly all right as long as there is no added laxative. A great many of those preparations have added to them cascara phenolphthalein or something of that sort these should not be used. It is purely a matter of personal choice as to which type of proprietary preparations are used to increase the bowel bulk. The ideal situation of course is not to use any type of medication and to get your patient as quickly as possible back to normal bowel function.

With the addition of roughage in the form of food such as cooked fruits cereals lettuce or something of that sort the condition may be brought more nearly to normal.

I am particularly glad that Dr Stevens discussed this paper because the neurotic side of these individuals is after all most important. A great many times I feel that I would give anything to be able to put these different individuals under the care of a competent psychiatrist. Unfortunately we can't place them all under the care of the psychiatrist and we have to do as much as we can for them along that line. I am particularly glad that he did discuss this phase of the problem and that he gave us some idea of the way in which their difficulties react upon their intestinal tracts.

## RECENT DEATHS

JOHNSTON—CHARLES E. JOHNSTON M.D. a resident of Portsmouth for two score years died at his home there on June 29 1936 after a long period of failing health. He was seventy three years old.

A graduate of the Dartmouth Medical School Dr Johnston practiced for several years in Norway and

As Dr Shields has stated it may be any condition in the gastrointestinal tract, with nervous symptoms and imbalance. I have often come in contact with the fact that many times people lay the beginning of their troubles to intestinal grippe, they think that is the cause of the difficulty.

The physical examination, as Dr Shields has told you does not generally show very much. The thing that I have found most constant is a tender cecum or tenderness along the colon. I generally do a rectal examination because I have found many of the cases of rectal irritation that way with perhaps a fissure. There may be an element there whether it is the cause or the result I am not sure but I think it is the result of taking cathartics and of constant irritation around the anus.

In making a diagnosis of irritable colon, I think it is really a process of elimination. It seems to me to be an elimination of all other conditions which may happen in the intestinal tract. These conditions have often been misinterpreted. I have treated a supposed case of duodenal ulcer without x-ray finding which proved later to be an irritable colon. I think that is quite apt to be the case. They simulate some other condition.

In the treatment, I agree entirely with the doctors' methods. Regulation in life is the prime essential, that is the method of living. In these days of hurry and scurry to get a livelihood many do not take the time to have a regular bowel movement. Many are so worried and depressed at the time of meals that they do not take the time to eat properly. Further I believe that rest after a meal is very essential and also the elimination of all aggravating factors such as tea, coffee and tobacco. Focal infections may also be undermining the patient.

As to the medication, I do not think it makes much difference what kind of emulsion is used anything that is a soft and nonirritating lubricant seems to me to be sufficient.

In regard to the use of belladonna, I think that it is very valuable. I often supplement this with small doses of phenobarbital. These prescriptions cannot be refilled and I so mark them for the attention of the druggist. The druggist will not refill these prescriptions unless the patient has been back to the physician to be looked over again.

There is just one other thing I wish to say that may not appeal to all of us. I have seen many cases operated upon for many different intestinal conditions. Appendicitis is the most common. After the rest and the diet which the patient has in the hospital following such an operation he generally improves but in several months he is right back again in the same condition. I think that we should be very careful about that and have a diagnosis established before operation.

PRESIDENT ABBOTT: This paper will be further discussed by Dr Fred E. Clow of Wolfeboro.

DR F. E. CLOW: Dr Shields is to be congratulated on the attitude he takes toward the victims of a disease with a new name, who have haunted the consulting rooms of doctors for years. Axel Munthe describes with gusto his management (for his own pocketbook) of the rich women of Paris who had colitis. Each generation has furnished its own name for the same old disease. The approach to its treatment by younger men is evidence of the fact that they recognize its etiology and its dependence on the nervous system to a great extent.

Constipation well nigh universal among women with pernicious cathartic drug habits grafted on a maladjusted personality, is sufficient to produce a train of most annoying and disabling symptoms. During the last few years it is obvious that high

roughage diet has increased the severity and it would seem the frequency of these difficulties.

Nothing can approach transduodenal lavage with hypertonic solutions for relief of the migraine that so often goes with an irritable colon. The thorough cleansing of the entire intestinal tract is the most effective method of starting right. Fluoroscopic examinations of the colon are important. The importance of this has been stressed in connection with a study of the patient's face. Hospital treatment unless one is ready for a long campaign is dangerous. These are the people who easily become habituated to a nursing routine from which it is difficult to dislodge them, unless one is an expert in psychotherapy.

Occurring as it does always in brain workers, school teachers, lawyers and women with too much time and too few children—those to quote Trice, 'individuals of ambition with keen desires, and among those who grieve and fret' the etiology must never be forgotten. The origin of the irritability must be sought not in the intestinal contents, not in the bacterial growth, but in the mind and brain of the patient.

PRESIDENT ABBOTT: The paper is now open for general discussion.

DR. LOUIS C. AGE: We have at present in the hospital at Rutland, a general medical service which has been recently established. All those patients coming in on that service go through my hands.

I noticed that the last speaker seemed to confine his remarks to women and to brain workers. We don't get brain workers in the Veterans Hospital nowadays to any great extent. We are naturally getting the down-and-out man who has lost his job, and a large percentage of permanent derelicts. The high percentage of gastrointestinal lesions which we get and which are so largely as has already been said, purely a neurotic condition, is astonishing.

Of course we have every facility there for x-ray work.

No man ever has chronic pain and tenderness in his stomach without a study by barium, if there is the slightest occasion for it.

I have lost my faith, to a considerable extent in gastrointestinal x-rays. We almost invariably find a lesion of some sort. We have had particularly strange results on the question of duodenal ulcer. Apparently deformity or absence of the cap is the rule rather than the exception. It is the same way in the colon. We always get with these patients, a rapid emptying of the colon.

The condition we accede, is partly due to malnutrition to improper or irregular food, together with emotional stress. But are there actual pathologic changes in all or may mere functional changes give the same effect?

These patients are all men from thirty-five to forty-five years of age in most instances. They are not brain workers. But mental strain will do most anything to anybody.

The reader of the paper did not distinguish, while I was here between a mucomembranous colitis and an irritable colon. We don't see this condition in these men, but we do see many instances of spasticity of various sections of the gastrointestinal tract.

I should like to ask the reader of the paper if there is any real reason for shifting over from psyllium seed to agar, whether there is any particular difference or just because the psychologic effect is good.

I have never seen the logic of the treatment of putting agar into the mineral oil. The agar is used to create a soft mass which will irritate but some



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Digging deeper into the recent mystery of how blowfly maggots stimulate healing in stubborn wounds a fact observed by surgeons during the World War Dr William Robinson of the U S Department of Agriculture now announces the possibility that urea, a well known and widely distributed chemical may be responsible along with allantoin for this remarkable healing produced by maggots

Dr Robinson has been investigating this subject in the Division of Insects Affecting Man and Animals Bureau of Entomology and Plant Quarantine He announced last year the discovery of allantoin in maggot excretions He now finds that urea is present also Preliminary tests indicate that the pure synthetic chemical by itself induces the same healing as maggots or allantoin These preliminary observations of course must be supplemented by additional clinical tests by competent physicians—and this is outside the scope of the Department's investigations

In an article appearing in the August number of the *American Journal of Surgery*\* Dr Robinson cites case histories provided by physicians surgeons and dentists who have used urea solution in the treatment of osteomyelitis gangrene old ulcers stubborn wounds infected burns and nonhealing gums and tooth sockets The reports are encouraging If borne out by subsequent clinical tests Dr Robinson's discovery will be of great importance to the medical profession — *Bulletin U S Dept of Agriculture*

Robinson William Use of urea to stimulate healing in chronic purulent wounds Am. J Surg 33:192 (Aug) 1936

Brunswick, Maine, before moving to Kittery, forty three years ago. He established residence in Portsmouth in 1895.

During the World War he served at Chickamauga Park, Georgia, as a Captain in the Medical Corps. He was a Mason, an Elk and a member of the Portsmouth and New Hampshire Medical Societies.

Dr Johnston is survived by his widow, Mrs Mary Noonan Johnston, a brother and three sisters.

**STOKES — DUDLEY L. STOKES, M.D.**, one of the oldest practicing physicians in Rochester, died at his home there on June 25, 1936 of a heart attack.

Dr Stokes was born in Freedom, N. H., in August, 1866 the son of Stephen and Esther (Mills) Stokes. He attended the public schools there and later graduated from the New Hampton school. He then attended the Dartmouth Medical School, from which he was graduated in 1888.

Upon graduation from the medical school Dr Stokes opened an office in Goffstown, N. H. He remained there for a little more than a year, during which time he married Miss Sarah Tyler, of Freedom. In 1891, he moved to Rochester and practiced there until the time of his death.

Dr Stokes was a member of the Strafford County the New Hampshire and American Medical Associations, the Dover Medical Society and the New Hampshire Surgical Club. He was also a 32nd degree Mason and a member of the Eastern Star.

Dr Stokes is survived by his wife, Mrs Sarah Stokes and three children, Elizabeth, Dr Leroy T. and Dr Samuel H. Stokes, a dentist.

**DOWNING — ARTHUR T. DOWNING, M.D.**, was born on October 22, 1877 at Hanover, N. H., the son of Lucien B. and Martha (Taylor) Downing. He was educated in the public schools of Hanover and at Kimball Union Academy in Meriden. He continued his education with an academic course at Dartmouth graduating with the class of 1900. He then entered the Dartmouth Medical School. For a year he served as an interne in the Mary Hitchcock Hospital in Hanover and then moved to Barrington where he practiced for two years. From there, he moved to Littleton, where he enjoyed a large practice up to shortly before his death on June 25, 1936.

In 1903 Dr Downing took as his bride Miss Mabel Moore of Plymouth, Vermont, and to them were born two sons, Everett and Allan.

On October 28, 1921, he was made a Fellow of the American College of Surgeons in recognition of the work he was doing at the Littleton Hospital.

Dr Downing was a member of the New Hampshire Medical Society. Fraternally he was a member of Burns Lodge Free and Accepted Masons, of Franklin Chapter, Knights Templars and of the Ancient Order of the Nobles of the Mystic Shrine and the Consistory. He was also president of the Littleton Hardware Company, a director of the Littleton Savings Bank and president of the Building and Loan Association.

He is survived by his widow and two sons.

**WATSON — MAURICE WATSON, M.D.**, aged sixty two, a prominent Manchester physician died at his summer home in Gilmanton on June 22, 1936.

Dr Watson received his A.B. degree from Dartmouth College in 1897 and his M.D. from the Dartmouth Medical School in 1901. He was registered to practice in the State of New Hampshire the same year.

Dr Watson held membership in the Manchester Medical Association and was a former member of the New Hampshire State Society. He was a Mason and a Shriner. A staunch Democrat, he was active in politics many years ago and at one time represented Ward 6 on the aldermanic board.

Survivors include his widow, Mrs Martha (Parsons) Watson, and two sons, Henry P. and William H. Watson, all of Manchester.

**LITTLE — CHARLES S. LITTLE, M.D.**, for the last twenty five years Superintendent of Letchworth Village, a state hospital for the feeble-minded, four miles from Haverstraw, N. Y., died at his home there on June 6, 1936.

Dr Little was born on February 12, 1869, at Webster, N. H. He was graduated from Dartmouth College in 1891. After his graduation he was civil engineer for two years then he returned to Dartmouth to receive a medical degree in 1896. In 1933 he received the degree of Doctor of Science from his Alma Mater.

Dr Little went to Letchworth Village from Laconia, N. H. where he had been Superintendent of the State School for Feeble Minded for several years. Previously he had been at the Tewksbury (Mass.) General Hospital and the Taunton (Mass.) State Hospital and the McLean Hospital near Boston.

Dr Little was married twice. His first wife was Miss Tertia Wilton of Hamilton, Ont. who died in 1913. In 1919, he married Miss Daphne Perkins, of Moores Corners, Mass., who survives him. He also leaves a daughter Miss Barbara Wilton Little and a son, Dr Sherman Little.

Dr Little was a member of the New Hampshire Medical Society, and the Belknap County Medical Society.

**NORTON — DANIEL C. NORTON, M.D.** died at his home in Manchester on July 4, 1936 after a lingering illness. He was in his fifty fifth year.

A native of New Britain, Conn., Dr Norton was graduated from Dartmouth College in 1904 and from the Dartmouth Medical School in 1907. A year of internship at the Boston City Hospital was followed by a year of study and clinical work at the Eye and Ear Infirmary in Boston.

In 1909 Dr Norton established his residence in Manchester, where he remained until his death building up one of the largest practices in the State and establishing a widespread reputation in his chosen field.

He was a member of the Manchester Medical Association, New Hampshire and New England Medical Societies, the New Hampshire Surgical Club and

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Acute pain in the abdomen in children, coming on suddenly with fever, nausea, vomiting and systemic reactions is frequently wrongly diagnosed acute appendicitis when actually due to early pyleitis or lobar pneumonia. The differential diagnosis is often difficult, for in the early stages, the child with pneumonia may have no signs in the lungs, and very early pyleitis may show a clear urine. It is usual for children with either disease to refer pain to the umbilical region or to one of the lower quadrants so that in cases of right-sided lung or kidney infection an innocent appendix is often removed. Without going at length into the differential diagnosis it might be worth while pointing out that as a general rule the child with appendicitis does not at onset, appear so ill as the one with either of the other conditions: fever, tenderness, general systemic reactions in the former are not nearly so severe, nor is the leukocyte count so high. In fact, the child with an acute appendicitis is notorious for not seeming sick. The signs and symptoms are often mild, a circumstance which accounts for the relatively large number of cases of ruptured appendices in children.

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The first symptom of the present illness (nosebleeds) appeared two years prior to admission. Four, three and two years before the onset of the nosebleeds she had had severe attacks of sore throat. Here we have a possible etiologic factor for either nephritis or rheumatic infection. The presence of headaches is more

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The attack of nocturnal dyspnea, with hemoptysis, was most likely due to left ventricular failure. It could be associated with hypertension, with mitral stenosis or other type of valvular disease. Puffiness of the face is not seen in congestive failure except with generalized edema, and is therefore in this case a distinct piece of evidence in favor of chronic nephritis. If chronic nephritis is present, it is surprising that there should be no mention of nocturia, caused by the inability of the urine to concentrate, always an outstanding feature of the advanced case of chronic glomerulonephritis.

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The past history is noncontributory.

Physical examination showed a well-developed and nourished pallid girl with an ammoniacal odor to her breath. The retinal arterioles were small and the discs were pale with somewhat hazy margins. There were no hemor-

rhages or exudate. A small amount of fresh blood was present within the nose. The heart was enlarged to the left and a blowing systolic murmur was heard at the apex. The blood pressure was 190/130. The lungs were clear and the remainder of the examination negative.

The temperature was 99°, the pulse 90. The respirations were 30.

Examination of the urine showed a maximum concentration of 1.014. There was a large trace of albumin and the sediment contained 8 to 10 white blood cells, 6 to 8 red blood cells, and a rare hyaline cast. A phenolsulphonephthalein test showed no excretion of dye at the end of one hour. The blood showed a red cell count of 2,660,000, with a hemoglobin of 40 per cent. The white cell count was 5,200, 75 per cent polymorphonuclears. The stools were negative. A Hinton test was negative. The nonprotein nitrogen of the blood was 130 milligrams and the plasma protein 5.1 grams. An electrocardiogram showed a late inversion of T<sub>1</sub> and a flat T<sub>2</sub> with small complexes. Lead IV was negative.

Plain films of the abdomen showed the faint shadows of rather small kidneys. There was no evidence of renal stone and the visualized bones appeared to be normal. A soft tissue mass in the left upper abdomen had the appearance of an enlarged spleen.

The patient was treated supportively and given a small transfusion. The nonprotein nitrogen rose to 175 milligrams and she was discharged for home care on the eighteenth hospital day.

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Following her discharge the patient became rapidly worse and developed orthopnea, edema of the legs, and drowsiness. She was brought to the hospital in a semiconscious state.

Physical examination showed a semicomatose patient with pallid dry skin and marked orthopnea. A few small hemorrhagic spots were noted in the skin and conjunctivae. The retina appeared edematous but no exudate was present. The chest showed dulness at both bases with increased tactile fremitus on the left. Many crackling râles were heard at the left apex anteriorly and throughout the left chest posteriorly. The heart was enlarged to the left and the sounds were pounding in character. The blood pressure was 175/120. There was pitting edema of the ankles.

The temperature was 101°, the pulse 130. The respirations were 25.

Examination of the urine was unchanged. The blood showed a red cell count of 1,870,000, with a hemoglobin of 40 per cent. The white cell count was 12,600, 89 per cent polymorphonuclears. The nonprotein nitrogen was 160 milligrams and the CO<sub>2</sub> combining power 36.9 volumes per cent.



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Following her discharge the patient became rapidly worse and developed orthopnea, edema of the legs, and drowsiness. She was brought to the hospital in a semiconscious state.

Physical examination showed a semicomatose patient with pallid dry skin and marked orthopnea. A few small hemorrhagic spots were noted in the skin and conjunctivae. The retina appeared edematous but no exudate was present. The chest showed dulness at both bases with increased tactile fremitus on the left. Many crackling râles were heard at the left apex anteriorly and throughout the left chest posteriorly. The heart was enlarged to the left and the sounds were pounding in character. The blood pressure was 175/120. There was pitting edema of the ankles.

The temperature was 101°, the pulse 130. The respirations were 25.

Examination of the urine was unchanged. The blood showed a red cell count of 1,870,000, with a hemoglobin of 40 per cent. The white cell count was 12,600, 89 per cent polymorphonuclears. The nonprotein nitrogen was 160 milligrams and the CO<sub>2</sub> combining power 36.9 volumes per cent.

The signs in the patient's chest gradually cleared up but her general condition remained critical. She developed occasional twitching and began to vomit frequently. The nonprotein nitrogen gradually rose to 270 milligrams. On the thirty-seventh hospital day she became comatose and died on the following day about two months after her initial entry.

#### DIFFERENTIAL DIAGNOSIS

DR F DENNETTE ADAMS. Recurrent persistent nosebleed occurring in a girl of this age if not caused by a local lesion, is due most likely to leukemia purpura or some other blood dyscrasia or to active rheumatic infection or nephritis with hypertension. There are no symptoms in the history given at the first admission to suggest a primary blood disease but there is sufficient evidence to justify a consideration of rheumatic heart disease and much more in favor of chronic nephritis.

Acute pain in the abdomen in children coming on suddenly with fever, nausea, vomiting and systemic reactions is frequently wrongly diagnosed acute appendicitis when actually due to early pylephlebitis or lobar pneumonia. The differential diagnosis is often difficult for in the early stages the child with pneumonia may have no signs in the lungs and very early pylephlebitis may show a clear urine. It is usual for children with either disease to refer pain to the umbilical region or to one of the lower quadrants so that in cases of right-sided lung or kidney infection an innocent appendix is often removed. Without going at length into the differential diagnosis it might be worth while pointing out that as a general rule the child with appendicitis does not at onset appear so ill as the one with either of the other conditions. Fever, tenderness, general systemic reactions in the former are not nearly so severe nor is the leukocyte count so high. In fact, the child with an acute appendicitis is notorious for not seeming sick. The signs and symptoms are often mild, a circumstance which accounts for the relatively large number of cases of ruptured appendices in children.

The statement that following the pylephlebitis this patient was discharged cured is worth comment. A kidney once infected may harbor bacteria for years and develop an immunity to them but recurrences of active infection can follow any additional burden put upon the individual by some other factor such as exposure, fatigue, pregnancy or ureteral block.

The first symptom of the present illness (nosebleeds) appeared two years prior to admission. Four, three and two years before the onset of the nosebleeds she had had severe attacks of sore throat. Here we have a possible etiologic factor for either nephritis or rheumatic infection. The presence of headaches is more

suggestive of nephritis. The other symptoms mentioned could be accounted for by either disease but with active rheumatic infection sufficient to cause as much trouble as this patient was experiencing one would certainly expect that joint symptoms of a mild degree at least would have occurred at some time previously.

The fact that the patient's physician found high blood pressure favors the diagnosis of nephritis, but this evidence cannot be too strongly relied upon since we are not given the systolic and diastolic levels. High systolic with high diastolic pressure would occur with nephritis, high systolic with low diastolic is a feature of insufficiency of the aortic valve due to rheumatic heart disease or syphilis.

The attack of nocturnal dyspnea with hemoptysis was most likely due to left ventricular failure. It could be associated with hypertension, with mitral stenosis or other type of valvular disease. Puffiness of the face is not seen in congestive failure except with generalized edema and is therefore in this case a distinct piece of evidence in favor of chronic nephritis. If chronic nephritis is present it is surprising that there should be no mention of nocturia caused by the inability of the urine to concentrate always an outstanding feature of the advanced case of chronic glomerulonephritis.

All things considered, there are more points in the history in favor of chronic glomerulonephritis than of any other condition.

The outstanding features of the physical examination were the pallor and the circulatory findings. Pallor can be a concomitant of almost any chronic disease, if true anemia were present we would be more suspicious of nephritis than of heart disease. The cardiac hypertrophy and the high blood pressure especially the high diastolic point definitely toward nephritis. The systolic murmur at the apex is undoubtedly caused not by actual valvular disease but by relative insufficiency of the mitral valve due to hypertrophy and dilatation of the left ventricle.

The laboratory findings clinch the diagnosis. If the maximum concentration of 1014 was determined by one of the concentration tests we have evidence of severe kidney damage. The other findings are quite consistent. The failure to concentrate urine and to excrete the dye indicate marked kidney failure.

A PHYSICIAN. What is the lower level of normal in the concentration test?

DR ADAMS. The test is done in this hospital by giving the patient nothing to eat or drink after 6 p. m. and collecting specimens at 6, 7 and 8 a. m. Some observers believe that if the test is performed in this manner the urine should show in the second or third specimen a concentration as high as 1026, and that any-



can imagine that transfusion was done in this case because the family may have demanded it

The second admission followed discharge by only twelve days, yet the patient was distinctly worse. Orthopnea and edema indicate increased failure of the cardiorenal system, drowsiness, an increase in the degree of uremia.

The small hemorrhagic spots noted in the skin and conjunctivae are common in the terminal stages of nephritis and are another indication of downward progress. So is edema of the discs. One would expect to find retinal changes in the form of hemorrhages and exudates.

The chest signs are confusing, particularly if, since they are not mentioned, we must assume that the breath sounds are normal. Dullness at the bases in this case could be a sign of terminal pneumonia, or of pulmonary congestion, or beginning hydrothorax based on cardiac failure. The râles in the left chest posteriorly could be interpreted as due to congestion or pneumonia, those at the apex cannot be explained. Increased tactile fremitus does not occur without some changes in the breath sounds. It is a sign of pulmonary consolidation or compression. It could be due in this case to pneumonia, or to compression from fluid in the pericardial sac, associated with the terminal pericarditis mentioned earlier.

The cardiac signs are those of a laboring, hypertrophied hypertensive heart.

There are three possible causes for the elevation of temperature: (1) terminal pneumonia, (2) terminal pericarditis, and (3) terminal colitis. The first can be associated with the final stages of almost any chronic disease, the two latter are peculiarly common in chronic nephritis. We have no direct evidence of any one of the three. Any of them could exist.

We have, then the typical picture presented by the completed case of chronic glomerulonephritis, with hypertension, hypertrophy and dilatation of the heart, and uremia. Bronchopneumonia, terminal pericarditis, or colitis—one or all—could be present, and clinically should always be looked for in these cases. Fluid may or may not be present in one or both pleural cavities. It is often a feature of terminal nephritis with uremia and cardiac failure. There is no conclusive evidence in this case either for or against it. It is always unwise, in advance of autopsy, to guess at the size of the kidneys. If forced to commit myself on that point, however, I would anticipate small, granular, contracted kidneys. This would be my conjecture even if the roentgenologist had not reported small kidneys.

DR MALLORY: What do you mean by "small" kidneys?

DR ADAMS: The normal kidneys together weigh about 250-260 grams; do they not?

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Hypertrophy and dilatation of the heart.

Chronic passive congestion.

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Secondary anemia is always present in advanced glomerulonephritis, hence the low erythrocyte count and hemoglobin.

A PHYSICIAN: How was the phenolsulphonephthalein test done?

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A PHYSICIAN: Why do you use the intravenous rather than the intramuscular method?

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DR TRACY B. MALLORY: There is also another important point brought out by Dr. Earle Chapman. The speed of excretion is even more important than the total excretion at the end of one or two hours. This can be adequately determined only by the intravenous method and fractional determination as just described.

A PHYSICIAN: Is delay considered important?

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I cannot explain the T wave changes and the low voltage in the electrocardiograms, unless there was pericardial effusion. This picture would fit coronary sclerosis, but one does not expect this condition at the age of nineteen. With a large heart and hypertension we would expect to have left axis deviation reported. Acute pericarditis, like colitis, is a common terminal event in uremia. If present, there might or might not be a friction rub.

The roentgen studies of the kidney were doubtless to exclude hydronephrosis, stone, or secondary enlargement due to block from stone, kinked ureter, or some similar cause. The bones were x-rayed very probably to provide evidence for or against hyperparathyroidism. Stone in the kidney, bone softening, cyst formation, and nephritis are all important symptoms of this disease, and we are always on the lookout for it here. There is no evidence in this case. Enlargement of the spleen by x-ray could be explained on the basis of chronic passive congestion, although one usually finds the liver also enlarged.

The history, physical examination, and laboratory findings are all typical of chronic glomerulonephritis in the uremic stage. Whether this disease might be related in some way to the former attack of pyelitis and be the end-result of a slowly progressing pyelonephritis cannot be stated. One suspects that it might be, yet there is a past history of three severe attacks of tonsillitis, so it is just as possible that the tonsils might have served as the focus of infection, and the pyelitis have had no relation to the later disease of the kidneys.

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## ANATOMIC DIAGNOSES

Chronic glomerulonephritis  
Atrophy (pyelonephritic ?) of the left kidney  
Cardiac hypertrophy  
Hydropneumothorax  
Hydrothorax, bilateral  
Ascites  
Colitis, acute hemorrhagic  
Purpura  
Bronchopneumonia

## PATHOLOGIC DISCUSSION

DR MALLORY: The autopsy showed very much what Dr Adams predicted. The pair of kidneys together weighed only 100 grams. It was interesting, however, that one of the kidneys was very much smaller than the other. We know there is a great deal of normal variation in the size of the kidneys and for that reason we commonly weigh them together rather than separately. One of these kidneys, however, weighed 80 grams and the other only 20. That seems rather more than could be considered a normal degree of variation on the two sides, although anything is possible down to a single kidney. The right kidney was the larger of the two, but of course it was nevertheless considerably smaller than normal. A normal kidney would weigh 150 grams. This weighed 80 grams, which is just about half the size. The capsules, as you would expect, stripped with a great deal of difficulty. In other words, there were adhesions between the capsules and the renal tissue as there always are when scar tissue has formed in the kidney substance. When the capsules finally were stripped they left scarred granular surfaces and the general color was rather yellowish, which would suggest that significant amounts of fat were present, probably a fatty degeneration. The calices were somewhat dilated and the pelvic fat increased. Grossly there was no definite evidence of pyelonephritis. Another gross finding was, of course, hypertrophy of the heart, which weighed 450 grams. The normal for her would probably have been 300 grams, so that it is considerably hypertrophied and that hypertrophy, as you would expect, was almost entirely in the left ventricle, undoubtedly secondary to the hypertension. The left ventricle measured 22 millimeters, whereas the normal usually is about 14 millimeters. The right ventricle was a little hypertrophied, measuring 5 millimeters, as against the normal of 3 millimeters. The liver was normal in size. The spleen was moderately enlarged weighing 330 grams. That was about twice the normal size but is still below the limit of palpability. You very seldom feel a spleen that does not weigh 400 grams or more. The pericardium contained about 500

cubic centimeters of clear fluid. There was no fibrin at all, in other words the terminal pericarditis that is almost a standard complication of uremia was not present here. How long that pericardial fluid had been there, there is no possibility of saying. We have seen occasional cases with negative chest plates taken within twenty-four hours of death that come to autopsy with a liter of fluid in the pericardium, and more than a liter in each of the chests, so tremendous amounts of fluid can accumulate in the serous cavities of the thorax in a very short period of time. It may all have appeared in the last twenty-four hours of life or may have been present for two or three weeks and may have accounted for some of the physical signs as Dr Adams suggested. The pleural cavities contained relatively little fluid and the lungs were markedly edematous and that lower lobe on the left, where the questionable signs were, showed a little more fluid than elsewhere, some collapse and very numerous focal hemorrhages. Hemorrhages similar to those which were seen in the skin were present in a great many of the organs, in the pericardium and on the pleural surfaces. There were scattered hemorrhages throughout the lung and very marked hemorrhage with some slight degree of ulceration in the colon, in other words, a terminal uremic colitis. It is a very rare case of nephritis dying in uremia that does not show either pericarditis or colitis. A great many show both. What they are due to we have not the faintest idea. The pericarditis is always sterile. It is apt to be present in the patient in the uremic state, regardless of whether the nonprotein nitrogen is 85 or 300. You may see it in uremia with a nonprotein nitrogen of 85 and it may not be present in a uremia with a nonprotein nitrogen of 300. It seems unlikely that it is directly due to nitrogen retention. There was one other finding that we are beginning to discover is very characteristic in cases of long standing renal insufficiency which Dr Adams did not mention and which we would not have thought of looking for a year ago. There is a quite close relationship between the parathyroids and renal insufficiency and if renal insufficiency is fairly chronic, that is if it has lasted more than a year, you can pretty regularly count on parathyroid enlargement. Usually it is relatively slight. In this case all four of the parathyroid glands were enlarged and the total weight of the parathyroid tissue was 6 grams. Normally each parathyroid weighs 30 milligrams and the total weight is a little over 1 gram. These are nearly five times the normal size. On the other hand we have seen two nephritics here and several have been reported from other places, in which parathyroid tissue weighing as much as 5 or 10 grams has been

found and those cases may begin to show all the clinical evidences of hyperparathyroidism including the formation of bone cysts. This patient had a single blood phosphorus done with this idea in mind just before death which was 15 as against the normal of 2.

The question that particularly interests pathologists in this sort of case is what kind of nephritis we are dealing with and there you get on very questionable ground. The commonest type of renal pathology leading to prolonged renal insufficiency in a young person is, of course, chronic glomerulonephritis and that is the first thing to think of here. The question of whether we have not too easily accepted all these cases as chronic glomerulonephritis has recently been raised, particularly by Dr. Longcope at the Johns Hopkins Hospital. Some of you very possibly have seen his articles. He feels that a quite significant number of cases of chronic renal insufficiency in young individuals are due to a long-standing "burnt-out" pyelonephritis rather than to glomerulonephritis. I have very little doubt he would immediately seize upon this case as evidence in support of his theory. In many of these cases you cannot get any history of pyelitis but that does not rule it out, because often the chronic type of disease causes very few symptoms unless from time to time it dams up and you get fever. It is perfectly possible for pyelitis to run for years and produce a great deal of damage without attacks of chills and fever. This girl we know had a fairly severe pyelitis at one time. And to go with that we have one markedly atrophied kidney. The microscopic sections of the smaller kidney showed a good deal of lymphocytic infiltration beneath the pelvic epithelium. It is very possible and I think probable that she had a rather severe pyelonephritis on that side. The other kidney, however, does not suggest it at all and looks like the typical end stage of chronic glomerulonephritis. So that I would be inclined to guess in this case that she had a double lesion, that she had a chronic glomerulonephritis and a pyelonephritis, which was localized to one side, and produced extensive atrophy of one kidney, in that way throwing a greater burden on the other kidney and speeding up the development of renal insufficiency.

A PHYSICIAN: Is it possible she might have had the original attack of pain from an impacted stone even though the stone could not be demonstrated?

DR. MALLORY: It is conceivable. We did not find any stones at autopsy. If she had had one it must have been passed. You do not have to have a stone to have a good deal of pain because pyelitis alone can cause it.

DR. ADAMS: Did you account for the enlargement of the spleen except by chronic passive congestion?

DR. MALLORY: I admit it is a somewhat inadequate explanation. It does not satisfy me because the liver was not quite so large as you would expect with passive congestion.

DR. ADAMS: There was very little passive congestion in the lungs by x-ray even back to the first admission.

A PHYSICIAN: Does the converse hold with parathyroid disease even of mild degree when chronic nephritis develops?

DR. MALLORY: Yes and no. There is always the possibility of developing secondary renal insufficiency in parathyroidism but it is directly due to one factor, that the large amounts of calcium that are excreted lead to the precipitation of calcium phosphate in the renal passages. The common thing to find is an ordinary renal stone in the pelvis. The majority of our parathyroid cases we have picked up by routinely hunting for hyperparathyroidism in all cases coming to the hospital because of stones. On the other hand, there is a group of cases or perhaps a stage in the disease in which the calcium is precipitated before it reaches the renal pelvis in the renal tubules themselves, and in that way calcium can be precipitated throughout the kidneys. Kidneys of that sort show up beautifully by x-ray and here we know there was no evidence of that. You can see the faint kidney outline that you often see in a flat plate but had they been calcified they would have stood out almost as clearly as bones do. It takes a very severe and very prolonged hyperparathyroidism in general to damage the kidneys seriously. The marked cases that we have seen have given histories of at least ten years' duration.

## CASE 22342

### PRESENTATION OF CASE

An eighteen day old Negro boy was admitted to the Massachusetts Eye and Ear Infirmary with a purulent discharge from both eyes.

The father and mother were living and well. There were two siblings, ages three and a half and one and a half years living and well. There was no family history of tuberculosis.

The child had been born on the maternity ward of a neighboring hospital. The usual prophylactic treatment had been given to the child's eyes at birth. At the age of twelve days the eyes began to show a slight discharge. This did not seem disturbing and the child was discharged home with the mother at the age of sixteen days.

At home however the eyes began to show a marked discharge and the child was brought to the Eye and Ear Infirmary by a visiting nurse. He was admitted to the ward. No gonococci were found on the smear.

The child's temperature on admission was 101.5°. It fell to normal on the third day in the hospital but on the fifth day it again became elevated and except for a period of two days the temperature was between 100° and 101° during his eleven days' stay at the Infirmary. The eyes responded to treatment very satisfactorily and seven days after admission were well. With the second rise of temperature the child began to show signs of a respiratory infection—a cough and a running nose. Râles were heard over the chest. An x-ray picture revealed some pulmonary infiltration. On the eleventh day in the hospital, when the child was twenty-nine days old, he was transferred to the Children's Medical Service at the Massachusetts General Hospital.

On admission to the General Hospital, the patient had a mucoid nasal discharge, a slightly injected throat, an occasional dry cough, and medium crepitant râles over the left back and axilla, with questionable dulness over this area. The heart was normal. The eyes were clear. The temperature was 98°, rose to 102° on the second day, but remained below 100° thereafter throughout his stay in the hospital.

No abnormalities were found on examination of the urine or stool. The blood showed a white cell count of 16,200, 37 per cent polymorphonuclears, 55 lymphocytes, 5 monocytes, and 1 eosinophil, the count rose to 35,000 two weeks later with 60 per cent polymorphonuclears, 38 lymphocytes, and 2 monocytes. The red cell count was 4,200,000 with a hemoglobin of 75 per cent. The red cells and platelets were normal in appearance. A tuberculin test 1:100 intradermally was negative.

The patient's general condition showed little change during the next three weeks. He had frequent troublesome coughing spells, the cough did not clear up with codein and expectorants. Râles were heard on both sides of his chest, especially on the left side. Probable dulness was present over both bases. He frequently had a mucopurulent discharge from his nose for which he was given, over a period of fourteen days, nose drops containing neosilvol and ephedrin, but no alcohol. His pulse varied between 120 and 170 and his respirations between 40 and 80. The temperature was normal. The child did not eat very well but maintained his weight. He did not vomit his feedings. X-ray examination two weeks after admission showed mottled dulness throughout both lung fields from apex to base. Three days later another film showed very much the same appearance except that the costophrenic angle was obliterated on the right. On the day before the child died his temperature fell for a few hours to between 96° and 97°. Death occurred suddenly and unexpectedly, the child

being found dead in bed, this was on the thirteenth day after his admission to the Eye and Ear Infirmary.

#### DIFFERENTIAL DIAGNOSIS

DR R. S. EUSTIS: The discharge from the eyes does not sound like a gonorrheal ophthalmia. There is no mention of examination of smears from the discharge. They should have been made and presumably were made and found to be negative. It is too late for a gonorrheal ophthalmia to flare up from infection at the time of delivery. If the child had been cared for at home it is possible that there might have been infection from the hands of the nurse, but I do not believe that is likely to occur in the hospital.

From the fact that the child was admitted to the ward I assume that the eyelids were pretty well swollen and they felt they could not get adequate drainage treating him as an outpatient.

No gonococci were found in the smear on entry to the Eye and Ear Infirmary. I believe that pretty well rules out a gonorrheal ophthalmia. We must remember, however, that there are many cases of nongonorrheal ophthalmia that are just about as severe as the gonorrheal variety.

The child's temperature on admission was 101.5°. My impression is that the condition of the eyes was probably not severe enough to account for that, and yet there is no mention in this record of any other infected area. Then the temperature comes back to normal, so that perhaps the eyes were causing it, as they improved rapidly under frequent irrigations.

At the time of transfer to the Massachusetts General Hospital I believe that he had an upper respiratory infection. Whether he had brought it into the Infirmary with him or whether he had caught it from some of the attendants at the Infirmary, I do not know. Upper respiratory infection in a newborn baby is a serious condition. It is very apt to extend down as this baby's infection extended down, causing bronchitis, and a bronchitis that lasts more than a day or so in a baby is a bronchopneumonia. I feel that at the time of admission to the Massachusetts General Hospital, even though the x-ray showed only a little pulmonary infiltration, the baby probably had both an upper respiratory infection and bronchopneumonia.

A normal temperature and the absence of bronchial breathing and dulness are compatible with the presence of bronchopneumonia during the newborn period. The first blood examination is normal for a three weeks' old baby. Two weeks later the white blood count rose to 35,000 with 60 per cent polymorphonuclears. This confirms the presence of infection.



and suggests the possibility of there being pus somewhere. We have no localizing symptoms as yet except the symptom of cough and the signs of bronchitis.

The negative tuberculin test does not rule out tuberculosis. A positive test would be important but the negative test means nothing. If the child has tuberculosis it must be an active process.

The patient's general condition showed little change during the next three weeks. He had frequent troublesome coughing spells. The cough did not clear up after codein. Did it suggest whooping cough?

DR HAROLD L. HIGGINS: It used to come in bouts.

DR EUSTIS: I do not think he had whooping cough. I have seen these cases of bronchopneumonia in the newborn with cough that sounded very much like whooping cough, possibly due to enlarged bronchial glands. Usually it is due to the presence of mucus in the trachea. Such a baby is weak, is lying on his back, is helpless, and has spasmodic cough.

They note particularly that there was no albolene in the nosedrops, because inhalation of oily fluids given for the treatment of nasopharyngitis may result in oily deposits through the lung which cause permanent damage and not, uncommonly, death. However, it is perfectly possible that even watery solutions if given too generously, might get into the windpipe of a weak infant and cause irritation and cough.

The rapid respiratory rate bears out the diagnosis of pulmonary infection.

He did not vomit. That is another important note, because vomitus may be inhaled by a weak infant and cause an inhalation pneumonia.

Is this mottled dulness in the x-ray bronchopneumonia, or is it the mottled dulness of milary tuberculosis? He certainly has pulmonary pathology but I do not think that pulmonary pathology is tuberculosis, do you Dr. Hampton?

DR AUBREY O. HAMPTON: This film shows a small fairly dull right upper lobe and what looks like enlarged glands at the right lung root. There is also density at the right base and at the left apex. The remainder of the left lung is fairly clear. The heart has shifted toward the right at this examination and I think the upper lobe is reduced in size. At the next examination the changes on the right have decreased somewhat but he now has a fairly diffuse process on the left side. This last film shows clearing in the upper lobe apparently. There is very little change in the remainder of the lung except that now he has a diffuse pleural effusion on the right side. This film at the first examination alone is not inconsistent with tuberculosis. He is three weeks old or thereabouts. We can say that he has congenital

atelectasis of the upper lobe and infection in the lung. While in the hospital this atelectatic upper lobe expands but the infection progresses.

DR EUSTIS: How do you explain this flattening of the costophrenic angles?

DR HAMPTON: It looks like a thin layer of free fluid that extends from the apex to the base. He is lying on his back.

DR EUSTIS: I do not believe he has tuberculosis. I think he has a descending infection from a head cold that he might have acquired at home or may possibly have picked up the first day or so in the Eve and Ear Infirmary. He came in without mention of head cold. We have evidence of enlarged bronchial glands that I mentioned in connection with paroxysmal cough, bronchopneumonia and some terminal complication. He had fluid in the right chest by x-ray. The question is, Was that fluid serous or purulent? In favor of its being an empyema is the high white count. There was not enough fluid there to kill him suddenly. There was no mention of displacement of the heart to the left but I think a young infant can perfectly well die suddenly from an empyema. There is also another possibility that during the last few days he may have developed a pericarditis. That is not an uncommon cause of sudden death in infancy and I suspect that may have been the case here, as such pericardial effusions in infancy are almost impossible to diagnose during life.

DR HAROLD L. HIGGINS: There were certain things about this case that made us think of whooping cough. In the first place he had a fairly normal temperature, paroxysms of coughing, a bronchitis which started as a common cold and then he died quite suddenly. A baby under six months when he gets whooping cough may get a spasm of the larynx and die in it although he may never have whooped at all. These whooping cough patients usually have been seen in several such spasms in which they cannot breathe and get cyanotic, before one occurs in which they die. Our patient was not exposed to whooping cough at home. He was at home only two days, and there has been no whooping cough in the hospital. There was an epidemic of bronchitis in the city very often bronchitis can give symptoms similar to whooping cough.

One has to think of lipopneumonia. Although he did not get albolene, I believe he did get cod liver oil, as all the babies at the Infirmary do. I think of this as a possibility although not as likely.

Of course tuberculosis was thought of by the staff, and also the possibility of aspiration of food and then again the possibility of upper respiratory infection which extended down to form a bronchopneumonia. About one-third of

the children with ophthalmia neonatorum that come to the Eye and Ear Infirmary have a gonococcus infection. In the other two-thirds no gonococci are found, some of them have pneumococcus infections of the eyes. The pneumococcus infection in his lungs, with bronchitis and bronchopneumonia, may have been secondary to the eye infection.

#### CLINICAL DIAGNOSIS

Bronchopneumonia

DR R S EUSTIS'S DIAGNOSIS

Ophthalmia neonatorum (nongonorrheal)

Nasopharyngitis

Bronchopneumonia

*Empyema?*

Pericarditis?

#### ANATOMIC DIAGNOSES

Streptococcus bronchopneumonia

#### PATHOLOGIC DISCUSSION

DR TRACY B MALLORY The x-ray examination I think was responsible for one misinter-

pretation here. The child had no fluid in the lungs but had marked pleural adhesions. Both pleural cavities were absolutely dry. There was an extremely extensive bronchitis and bronchiolitis running down to the most terminal branches of the tree. There was a moderate amount of pneumonia but a good deal more collapse. That is very characteristic of bronchopneumonia as one sees it in infants. The bronchi are usually very widely involved and the changes in the lung are rather more those of atelectasis than consolidation. There were, however, in this case, numerous dilated alveoli filled with exudate as well. Cultures from the lungs and the heart blood showed streptococci, both hemolytic and nonhemolytic. We did not find pneumococci. The question as to whether it might have been whooping cough, I think the postmortem fails to answer. It is perfectly conceivable that it could have been. We did not make cultures direct from the bronchi for pertussis organism and the microscopic picture of the lungs is not distinct enough to make the diagnosis.

A PHYSICIAN How about lipopneumonia?

DR MALLORY There was none.

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## MEDICAL SCIENCE FOR THE LAYMAN

AN increasing number of articles dealing with the modern advances of science is constantly appearing in the daily press, and one cannot fail to be impressed with the improvement in the quality and accuracy of such reports. This improvement is due in a large part, to the reprinting of material released by *Science Service*, a nonprofit institution in Washington founded in 1921 for the express purpose of making available to the general public short, simply worded, accurate and interesting accounts of scientific advances. Its work is supervised by a board of trustees nominated by the National Academy of Sciences, the National Research Council, the American Association for the Advancement of Science, the E. W. Scripps Estate and the journalistic profession. This agency is to be congratulated for fulfilling its function so well particularly in matters concerning the more exact sciences such as astronomy, physics and chemistry.

With the biologic sciences the value of such

abstracts is often questionable, particularly in those dealing with the science of medicine. In spite of the accurateness of the original résumé, it is frequently falsely interpreted either by the staff of the newspaper or by the readers. Either or both fail to realize that medicine is one of the less exact sciences, that the claims of one man or one group must be confirmed by many others before they can be accepted, that experimental findings have numerous limitations and that many fundamentally important contributions have, at the moment, little, if any, practical application.

Why falsely raise the hopes of a cancer-fearful public by reporting an alleged cancer cure, when it is well-known to all physicians that any cure based on an observation period of less than five years is open to doubt? Why capitalize on the observed experimental fact that a suspension in the air of the virus of influenza can be killed by ultraviolet light rays, when any attempt, at the moment, to apply the observation to the control of the disease is obviously futile? Or, why suggest that all post-operative infection may be eliminated by sterilizing the air of the operating room with the same ultraviolet light rays, when it is well known to the majority of surgeons that the simplest way to guard against air-borne infection is to be sure that no individuals harboring hemolytic streptococci in their noses or throats are included on the operating team?

When papers are read before a group of medical men the authors realize that their audience is fully aware of the necessary limitations and will interpret the findings accordingly. Such is not the case with the reading public and one cannot help but comment on the desirability of more reserved newspaper reporting of papers dealing with the medical sciences.

## THE REDUCTION OF NEONATAL MORTALITY

DR. CHARLES F. WILANSKY, Deputy Commissioner of Public Health of Boston, has been reported to have said that "premature birth is the chief cause of mortality under one year of age." This opinion seems to be substantiated by the fact that, of the fifty babies of each thousand born in Boston who die in the first year of life from thirty to thirty-five die during the first two weeks of life.

Boston already has shown a marked reduction in the infant mortality rate which was eighty-four out of every thousand in the first year of life in 1926. This rate has been reduced to about fifty at the present time. It is reasonable to expect that progress will follow proper care of those born prematurely if modern methods of treatment are more generally adopted.

Dr Wilnsky's purpose is to follow the plan now in operation in Chicago where infants born prematurely are placed in a heated incubator and promptly sent to well-equipped centers where constant medical and nursing care is available. In order to assure the likelihood of survival of these babies legislation should be adopted requiring the transfer of such cases to approved institutions, or the utilization of an incubator under the expert medical and nursing care plan. In furtherance of this object there is recommended more general attendance, particularly by those unable to avail themselves of the services of a private physician at the eighteen baby clinics in Boston, of mothers with these babies for instruction in the details of intelligent care of infants in the early weeks of life. These combined plans warrant a very reasonable expectation of a material reduction in mortality rates among children in the first year of life.

The assistance of the family doctor is especially indicated, both in his repeated examinations of infants in early life and in securing the co operation of parents, when indicated, with the great importance of having premature babies cared for according to Dr Wilnsky's proposed plan.

### THIS WEEK'S ISSUE

CONTAINS articles by the following named authors

THURMON, FRANCIS M. B.S., M.D. Harvard University Medical School 1926. Physician-in-Chief of the Clinic of Dermatology and Syphilology, The Boston Dispensary. Assistant Professor of Dermatology and Syphilis, Tufts College Medical School. Consulting Dermatologist, Boston Floating Hospital. Consultant, Tumor Clinic, The Boston Dispensary. His subject is Bismuth Ethyl Camphorate. Clinical Observations on a New Oil Soluble Bismuth in the Treatment of Syphilis. Page 315. Address 520 Commonwealth Avenue, Boston.

SWARTZ, J. H. M.D. Harvard University Medical School 1920. Instructor in Dermatology, Harvard University Medical School. Member, American Dermatological Association. Assistant Dermatologist, Massachusetts General Hospital. Visiting Dermatologist, Beth Israel Hospital. Consulting Dermatologist, Massachusetts Eye and Ear Infirmary and Boston Psychopathic Hospital. His subject is The Role of Fungi in Medicine. Page 322. Address 371 Commonwealth Avenue, Boston.

SULZBERGER, MARION B. M.D. University of Zurich 1926. Assistant Professor of Clinical

Dermatology and Syphilology, New York Post Graduate Medical School of Columbia University. His subject is Remarks on Definitions and Classification in Certain Forms of Dermatologic Allergy. Page 330. Address 962 Park Avenue, New York City.

SULLIVAN, EDWARD COPPINGER. M.D. Harvard University Medical School 1903. Director, Venereal Disease Clinic, Springfield Hospital. His subject is The Doctor and Early Syphilis. Page 336. Address 1597 Main Street, Springfield, Mass.

ABBOTT, CLIFTON S. M.D. Dartmouth Medical School 1894. F.A.C.S. Formerly President, New Hampshire Medical Society. Surgeon, Laconia Hospital. His subject is The President's Address. Page 342. Address 507 Main Street, Laconia, N.H.

SHIELDS, J. DUNBAR. B.S., M.D. Tulane University of Louisiana School of Medicine 1931. Member of Medical Staff, Margaret Pillsbury General Hospital, Concord, N.H. His subject is The Irritable Colon. Diagnosis and Treatment by the General Practitioner. Page 344. Address 4 No. State Street, Concord, N.H.

### MISCELLANY

#### DR. W. R. MACAUSLAND'S APPOINTMENT AND THAT OF DR. A. R. MACAUSLAND

Governor Curley has appointed Dr. William Russell MacAusland to the position of member of the board of trustees of the Massachusetts State School for Crippled Children at Canton. Dr. MacAusland takes the position made vacant by the death of Mr. Walter C. Baylles. Other positions held by Dr. MacAusland are trustee and medical director of the Berkshire School for Crippled Children at Pittsfield, trustee of the Balch Hospital for Crippled Children at Manchester, New Hampshire, and director and trustee of the Solemar convalescent hospital at South Dartmouth.

Dr. W. R. MacAusland and his brother Dr. Andrew R. MacAusland were recently appointed to the Staff of the Tufts College Medical School as Clinical Professors of Orthopedic Surgery.

#### THE MEDICAL DIRECTOR OF THE UNITED STATES QUARANTINE STATION, BOSTON HARBOR

Medical Director H. J. Warner of the United States Public Health Service has been directed to assume charge of the Quarantine Station at Gallops Island, Boston Harbor, on or about October 10, 1936. He will fill the position made vacant by the transfer of Passed Assistant Surgeon A. J. Aselmeyer to another position.

## CORRESPONDENCE

THE USE OF QUINIDINE—AN EXPLANATION  
Editor *New England Journal of Medicine*,

In the review in the *Journal* of June 18, page 1271, of my book, "The Diagnosis and Treatment of Diseases of the Heart" occur these words, 'It would seem unwise to recommend intravenous quinidine to the general practitioner without an added word of warning as to its danger. As this might create the idea that I advise that quinidine be given intravenously. It seems worthwhile to state that quinidine is indexed in this book as being discussed in relation to five varieties of cardiac disturbance, in all except one of these mouth dosage is advised there is considerable discussion of the dangers from quinidine even when given by mouth. In only one condition paroxysmal ventricular tachycardia, is other than mouth dosage mentioned and then only in the following words 'It would seem wise to give the first dose intravenously using 0.2 to 0.3 gm.' I trust this rather unfortunate statement of the reviewer will not lead any general practitioner on my supposed advice to use quinidine other than by mouth except as suggested in the last quoted sentence.

To follow my advice. On the whole, alcoholic beverages seem to me to be inimicable for the patient with angina. Will not in my judgment, harm many, if any, patients.

To consider abnormal deposits of glycogen in the muscle as a variety of 'congenital idopathic hypertrophy' of the heart seems hardly in accord with my idea of a proper terminology.

Yours truly,

HENRY A. CHRISTIAN M.D.

## REPLY TO DR. CHRISTIAN'S LETTER\*

There is no essential difference of opinion in the views of Dr. Christian and the reviewer so far as the use of quinidine is concerned, and it is worth noting that Dr. Christian says on page 297, 'I have witnessed fatalities, which have given me a very healthy respect for the dangers of quinidine sulphate therapy.' The impression given by Dr. Christian so far as ventricular paroxysmal tachycardia is concerned is that it always accompanies very serious cardiac conditions and as such requires prompt and thorough treatment. While this is usually true in occasional cases it seems to carry no more serious prognostic implications than does arrhythmic paroxysmal tachycardia. It therefore seemed not inappropriate to comment on the suggestion that in ventricular paroxysmal tachycardia it would seem wise to give the first dose [of quinidine sulphate] intravenously using 0.2 to 0.3 gram because of the even greater danger of the drug by this than by the oral route.

So far as the use of alcoholic beverages in the treatment of angina is concerned omission of them will not harm many patients but in some alcohol is

By the Reviewer

distinctly beneficial and the reviewer's experience of its value would coincide more nearly with that of Heberden in his original description of angina 150 years ago.

The etiology of congenital idopathic hypertrophy of the heart is unsolved. If recent work showing that it may be related at times to abnormal glycogen deposits in heart muscle is to lead to more accurate classification of related syndromes it seems fair to mention it if only to suggest to those having opportunity to study such cases pathologically, the possibility of finding it by special staining methods.

## RECENT DEATHS

**DODGE**—WILLIAM WOOLDREDGE DODGE, M.D., aged 79 a retired physician of Hamilton Massachusetts died at the Beverly Hospital August 11, 1936, after a long illness.

Dr. Dodge was born in Marblehead was educated in the public schools and was a graduate of Tufts College and the Medical School of Harvard University.

He joined the Massachusetts Medical Society in 1886 and retired in 1924. He was also a Fellow of the American Medical Association. During his active years he practiced in Boston.

**GOVE**—WILFRED FREEMAN GOVE, M.D., of 15 Sawyer Street, Wareham Massachusetts, died June 26 1936. Dr. Gove was born in 1895 and graduated from the Boston University School of Medicine in 1926. He joined the Massachusetts Medical Society in 1927 and was also a Fellow of the American Medical Association.

## NOTICE

UNITED STATES CIVIL SERVICE  
EXAMINATIONS

Senior Public Health Nursing Consultant,  
\$4 600 a Year

Public Health Nursing Consultant, \$3 800 a Year  
Associate Public Health Nursing Consultant,  
\$3 200 a Year

Assistant Public Health Nursing Consultant  
\$2 600 a Year

Public Health Nursing Assistant \$2,000 a Year

Applications must be on file with the United States Civil Service Commission at Washington D C not later than August 31 1936

## NOTICE OF MEETING

## WORCESTER DISTRICT MEDICAL SOCIETY

## CHANGES IN SCHEDULE 1936-1937

The meeting scheduled for September 16 has been postponed to September 23. The speakers for this meeting will be Dr. Richard Miller and Dr. Cadis Phipps of Boston who will give a symposium on Peptic Ulcer with Dr. Miller discussing the surgi-

cal aspects and Dr Phipps the medical aspects of this condition

Thursday afternoon, November 5, at 4 30 in the rooms of the Worcester Medical Library Inc at 34 Elm Street, Worcester, will be held the fall Censors meeting

Thursday afternoon, May 6 1937 at 4 30 in the rooms of the Worcester Medical Library Inc, at 34 Elm Street, Worcester will be held the spring meeting of the Board of Censors

### SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

#### CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, AUGUST 24, 1936

Saturday, August 29—

\*10 a m - 12 m Staff Rounds at the Peter Bent Brigham Hospital Conducted by Dr Reginald Fitz

\*Open to the medical profession

August 24 29—Harvard University Tercentenary Celebration See page 1166 issue of June 4 School of Public Health page 310 issue of August 13

September 4 to 8—First Congress of the Austrian Society for the Study of Roentgenology For details address Allgemeines Krankenhaus Alserstrasse 4 Wien IX, before September 1

September 7, 8, and 9—The Cancer Institute See page 803 issue of August 13

September 7 10—International Union against Tuberculosis See page 554, issue of March 12

September 7 11—American Congress of Physical Therapy will meet at the Waldorf-Astoria New York City See page 62 issue of July 2

September 9 to 12—Sixth Congress of the International Society for Urology For details address Dr Theodor Hrytschak Rathausstrasse 3 Wien I

September 14 and 15—Tercentenary Session of the Harvard Medical School See page 1166 issue of June 4

September 16 21—First International Congress of Sanatoria and Private Nursing Homes See page 803 issue of April 16 and page 264 issue of August 6

September 22 23 24—Twelfth Clinical Congress of the Connecticut State Medical Society See page 217 issue of July 30

October 12 18—Third International Congress on Malaria. See page 1076 issue of May 21

October 19 23—Clinical Congress of the American College of Surgeons See page 180 issue of January 23

October 19 31—1936 Graduate Fortnight of the New York Academy of Medicine See page 1221, issue of June 11

October 20 22—Academy of Physical Medicine Annual Meeting Hotel Statler Boston

October 20 23—The American Public Health Association See page 1226 issue of June 11

March 30 April 2, 1937—First International Conference on Fever Therapy Postponement notice See page 62 issue of July 2

April 21 24, 1937—American Society for Experimental Pathology See page 1076 issue of May 21

### DISTRICT MEDICAL SOCIETY

#### WORCESTER DISTRICT MEDICAL SOCIETY

September 23 1936 May 12 1937—See page 312 issue of August 13 and page 363 of this issue

### BOOKS RECEIVED FOR REVIEW

Passive Vascular Exercises and the Conservative Management of Obliterative Arterial Diseases of the Extremities Louis G Herrmann 288 pp Philadelphia and London J B Lippincott Company

Diseases of the Respiratory Tract. Eighth Annual Graduate Fortnight of the New York Academy of

Medicine J Burns Amberson, Jr, George Blumer, et al 418 pp Philadelphia and London W B Saunders Company

The International Medical Annual A Year Book of Treatment and Practitioner's Index Edited by H Letheby Tidy and A Rendie Short 555 pp Baltimore William Wood & Company \$6 00

Collected Writings Alfred F Hess Volumes I and II 719 pp and 734 pp Springfield and Baltimore Charles C Thomas \$15 00

The Extra Ocular Muscles A Clinical Study of Normal and Abnormal Ocular Motility Luther C Peter 351 pp Second Edition Philadelphia Lea & Febiger \$4 50

Sex and the Love Impulse An Outspoken Guide to Happy Marriage J H Burns 61 pp New York Emerson Books, Inc 50c

Illustrious Contributors to Public Health Charles Frederick Bolduan 33 pp Privately printed 1936

Food, Fitness and Figure Jacob Buckstein 252 pp New York Emerson Books, Inc \$2 00

Principles and Practice of Recreational Therapy for the Mentally Ill John Elseie Davis In collaboration with William Rush Dunton, Jr 206 pp New York A S Barnes & Company \$3 00

The Patient and the Weather Volume I Part 2 William F Petersen and Margaret E Miliken 781 pp Ann Arbor Edwards Brothers Inc \$9 00

Security Against Sickness A Study of Health Insurance I S Falk 423 pp New York Doubleday Doran & Company Inc \$4 00

International Clinics Edited by Louis Hamman Volume II, Forty Sixth Series 1936 327 pp Philadelphia Montreal London J B Lippincott Company

Syphilis and its Treatment William A Hinton 321 pp New York The Macmillan Company \$3 50

Collected Papers of the Mayo Clinic and The Mayo Foundation Volume 27 Edited by Richard M Hewitt, Lloyd G Potter and A. B Nevling 1353 pp Philadelphia and London W B Saunders Company \$12 00

The Study of Anatomy Written for the Medical Student S E Whitnall Third Edition 113 pp Baltimore William Wood & Company \$1 75

Diseases of the Nose, Throat and Ear For Practitioners and Students. Edited by A Logan Turner and others Fourth Edition, Revised and Enlarged 473 pp Baltimore William Wood & Company \$6 00

A Textbook of Histology Joseph Krafka Jr 246 pp Baltimore The Williams & Wilkins Company \$2 50

Urology in Women A Handbook of Urinary Diseases in the Female Sex E Catherine Lewis Second Edition 100 pp Baltimore William Wood & Company \$2 25

On Percussion of the Chest. Being a Translation of Auenbrugger's Original Treatise John Forbes 31 pp Baltimore The Johns Hopkins Press 75c

Synopsis of Diseases of the Heart and Arteries George R Herrmann 344 pp St Louis The C V Mosby Company \$4 00

**Exophthalmic Goiter and Its Medical Treatment.** Israel Bram 456 pp Second Edition Completely Revised and Enlarged. St. Louis The C V Mosby Company \$6 00

**Proceedings of the Twenty-Fifth, Twenty-Sixth, Twenty-Seventh and Twenty-Eighth Conferences of the American Association of Medical Milk Commissions, inc.** 363 pp

**League of Nations Quarterly Bulletin of the Health Organization** Volume V No 1 March 1936 209 pp 65c

**Medical Science Exhibits A Century of Progress** Eben J Carey 204 pp \$2 00

## BOOK REVIEWS

**An Index of Differential Diagnosis of Main Symptoms by Various Writers.** Edited by Herbert French Fifth Edition. 1145 pp Baltimore William Wood & Company \$16 00

French's Differential Diagnosis almost it needs no review! What a name and what a book to ponder on! It is surely a medical classic and if less expensive would rest on every student's and practitioner's bookshelf together with Osler's volume. Since its first printing in 1912, how many generations of medical students have industriously conned its tables of symptoms and differential signs how many patients have benefited by the knowledge the practitioner has gleaned from its well-written pages.

It is an encyclopedic work not the least feature of which is the readiness with which any symptom however obscure can be referred to in the truly remarkable index of 218 pages. The symptoms are moreover alphabetically arranged in the body of the work and well and fully described in systematic form. Discussion of differential diagnosis proceeds logically out of the presenting symptoms as they appear to the examining physician as he tries to solve the riddle of the patient at hand. Despite its profound erudition the practicality and readability of the work is amazing and in keeping with the best traditions of the British school of writing. Parenthetically it might be said that we in this country have yet to develop the smooth and lucid style of our English cousins. Are we becoming too scientific for a good literary style?

French's Differential Diagnosis is more than a mere diagnosis or classification of symptoms. In its pages may be found the equivalent of a volume on clinical pathology another on dermatology with good measures thrown in of neurology surgery gynecology and ophthalmology. Most of the laboratory tests are fully described and well illustrated. The exception which of course proves the rule is concerned with the blood cells. The sections relating to anemia leukopenia and so forth may well be said to be archaic and might have been written twenty years or so ago. Aplastic anemia for example is considered under pernicious anemia. There is still a good deal said of that outmoded disease chlorosis

and no mention of chronic hypochromic (iron deficient) anemia. The term large oval corpuscle has not yet been superseded by the universally used word 'monocyte' nor is there any mention of the hematocrit mean corpuscular volume Price-Jones curve average red cell diameter Schilling hemogram the blood platelet count and so forth, despite the importance of these diagnostic points in the diagnosis of a hematological problem. Nor is there any mention of the sedimentation rate which is now so widely used both in diagnosis and prognosis. Many methods are described for the minute study of the urine but not a single one is given for the determination of the amount of hemoglobin in the blood. The little section on agranulocytosis might be criticized since one reads that 'The outlook is grave and the blood counts not really important' hence the name of this infective and fatal form of sore throat.

The editor states in his preface that "many tests have been omitted purposely on the ground that as laboratory methods their bed rock reliability has not yet been established. In another place he says 'technique has become almost too perfect for when clinical methods become too delicate they begin to lose some of their clinical value.' This is undoubtedly true but the editor will agree that in a thorough revision one expects to find methods now commonly in use in most medical centres. It might have been worth while to place on the editorial staff someone with a good knowledge of things hematological.

The foregoing might conceivably be classed as captious criticism and should detract in no whit from the great bulk of the work which one supposes is as near perfection as can be obtained in such a wide and difficult field. The illustrations require special mention. They have not been stinted, either in number or in quality. The almost 200 colored lithographs are beautifully done and approach in quality the best of the German or Italian lithographs. The new reproductions of water color paintings by the artist Thornton Shiells have a delicacy of color which makes them exceedingly lifelike. Indeed it is the quality and number of the illustrations which chiefly distinguish this edition from its predecessor.

The physician who possesses this remarkable work must undoubtedly learn to prize it as his most valuable medical servant. To the reviewer it has been a real pleasure to scan again its many pages and to imbibed deeply of the wisdom in the many tables and illustrations.

**Urethrography** Folke Knutsson 150 pp Stockholm P A Norstedt & Söner Swed cr 12 — net.

This short monograph on Urethrography is well presented and is based on urethrograms done on 154 patients in Maria Hospital in Stockholm.

This procedure was carried out on thirty-three patients with normal urethras eighty-five with inflammatory changes in the urethra and prostate (except tuberculosis) nineteen on cases with prostatic hypertrophy twelve on postprostatectomy patients and



the remainder on patients with traumatic stricture, tuberculosis of urethra, cancer of the prostate and atrophy of the prostate

The author has a special 20 cc urethral syringe attached to a penile clamp. Twenty per cent Iodipin (iodine in oil) is used as the opaque fluid. Films are taken in various positions pre- and postinjection: two anterior-posterior views, one before and one after injection, a left and right oblique view, and a lateral view. The author states that in normal cases, there is never any contrast filling of the glands of Littre, the prostatic ducts or the seminal vesicles. In four cases urethrovenous reflux occurred, i.e., the contrast medium passed into the blood vessels of the penis. This, Knutsson states, is the only dangerous complication which may occur in urethrography.

The only question that can be raised about this well-done bit of clinical research is whether the procedure is of great aid in the diagnosis of urethral diseases. There are many urologists in this country who feel that urethrography is very helpful only in an extremely limited number of cases.

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**Examination of the Patient and Symptomatic Diagnosis.** John Watts Murray. Second Edition. 1219 pp. St. Louis. The C. V. Mosby Company. \$10.00

The constant emphasis by teachers of medicine upon the value of a careful history as an approach to diagnosis is presented in this book in a didactic fashion. The bulk of this large volume is devoted to the connotation of symptoms, first as symptoms per se, and later, as they are encountered in specific diseases.

Unfortunately, the book is marred by a number of errors of omission and commission and many dogmatic assertions which are debatable. Space does not permit more than mention of some of these. Among the omissions is the failure to mention leukemia and agranulocytosis as causes of gangrene of the mouth. Under 'Nails' no mention is made of changes caused by hypochromic anemia. Hiccup is omitted as a symptom of diaphragmatic pleurisy. There is no reference to or description of monocytes in the cytology of the blood. The same applies to infectious mononucleosis and aleukemic leukemia. The author accepts the American Heart Association classification of heart disease but ignores the important group of hypertensive heart disease.

The following statements seem queer in a modern textbook: "Cardiac arrhythmia may be due to dyspepsia. Permanent bradycardia is usually associated with coronary sclerosis and myocarditis. Irregularities in sexual life may give rise to heart disease. Sometimes occupations which necessitate out of door life and exercise may contribute toward the development of pulmonary tuberculosis but usually people who live out of doors are less likely to develop tuberculosis than are those who do not get the proper amount of exercise in the open air and sunshine. Intercostal neuralgia is at times a precursor of pleurisy and pulmonary disease, but

the examiner may find that the supposed intercostal neuralgia is really a more serious disease. Purpura hemorrhagica is both hereditary and congenital."

A further drawback is the attempt, in the latter part of the book, to make this a textbook of medicine. The net result is a woefully inadequate discussion of etiological, pathological and prognostic aspects of disease, the total absence of physiological background and an occasional allusion to therapy.

Its chief value appears to be that the student or practitioner reading it cannot escape the powerful argument that meticulous care in eliciting a history is the sine qua non of medical practice. It also presents in concrete form interesting and important facts which should prove of distinct value to any one desirous of returning to first principles. From this point of view, it may be regarded as dealing with the groundwork of bedside practice. Beyond that its deficiencies exceed its value.

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**The Art of Ministering to the Sick.** Richard C. Cabot and Russell L. Dicks. 384 pp. New York. The Macmillan Company. \$3.00

Although this book by Cabot and Dicks is addressed primarily to ministers, and deals chiefly with the duties and opportunities of the minister in helping those who are sick, it should be read by every doctor as well. So clearly and so forcefully do the authors present the psychology of the hospital patient that the reader is made cognizant of many aspects of illness of which hitherto he has been unaware.

The book approaches its problem from several points of view. Throughout its pages there is a philosophy based upon a nonsectarian but active religious faith: this constant stream of the consciousness of man's position in the universe plays about and illuminates all the practical suggestions arising from the authors' experiences with sick people.

The technique by which a minister may render help is given in detail; these suggestions are extremely valuable. Constant emphasis is laid upon the cultivation of the habit of listening and of the use of quietness to calm the patient's mind. The value for the minister of keeping records of cases is stressed; it would seem rightly. The reviewer was particularly impressed with the clarity and logic of the chapters which deal with Operations, the Dying and the Bereaved. There is no false sentimentality here: every word rings true.

In their preface, the authors request reviewers to criticize nine ideas which they have woven into their thesis. To one reviewer at least these ideas appear thoroughly sound.

There is so much in this book that no brief review can summarize its contents. It is at one and the same time an exposition of the philosophy of life, a handbook for all who come into contact with sick people, and a guide to help the patient himself to understand the behavior often apparently inexplicable of those who are responsible for his welfare. You will be a better physician if you read it.

**Physiology of Love** Paolo Mantegazza 237 pp  
New York Eugenics Publishing Company

Mantegazza's 'Physiology of Love,' written immediately after the publication of Darwin's 'Descent of Man and Selection in Relation to Sex,' was unquestionably inspired by these books. There is plenty of original thought, however, hidden beneath the flowery language in which Mantegazza writes. In his introduction the author says, "My style assumed a warmth and color unnecessary to my purpose to stimulate people to reflection."

Without doubt this purpose was achieved when the book first appeared in 1872 but it is questionable whether the modern reader will find it particularly stimulating. The love depicted by Mantegazza is of such high emotional content that it appears unfamiliar to people accustomed to the calmer, more philosophical, love of the present day. Possibly this unfamiliarity may be due in part to racial differences.

'Physiology of Love' should by rights be called 'Psychology of Love' for it has but little to do with physiology. The author traces the development of love from its manifestations among plants and animals to those in man, he analyzes its satellite emotions—hate, jealousy, modesty its connection with the senses with thought with chastity.

The two great iniquities of love, according to Mantegazza, are first, impotence, and secondly, prostitution. Although the author excoriated both of these he believed that prostitution was a necessary evil.

So must we do, until progress will have given all men a home and a woman, until the development of education will have taught many the holy joys of chastity.

There is much wisdom in this classic of fifty years ago if one does not weary of the bombastic but vigorous style in which it is couched. Many of Mantegazza's suggestions for purifying and ennobling the relations of the sexes are equally pertinent today, but most of the book seems to apply to a type of love which is entirely apart from the sober married love that is the only form recognized in this day and country.

**Post Mortems and Morbid Anatomy** Theodore Shennan Third Edition 716 pp Baltimore  
William Wood & Company \$9.00

This book presents the technique for performing postmortem examinations and includes with it a description of the various gross lesions which may be encountered in each organ. The manner of arrangement of the material follows the method used in performing autopsies. It begins with a section on the external examination primary incision and the examination of the body cavities. Then sections are devoted to the various systems each beginning with the technique of dissection followed by a description of the gross lesions which may be encountered. The discussion of the postmortem technique

is brief but concise. Its value is somewhat impaired by the separation of the sections devoted to each organ. There are a few diagrams indicating lines of incision but considerably less than might be useful to the beginner in autopsy technique. Discussion of the various disease processes is presented briefly from the standpoint of pure pathological anatomy. There are numerous photographs of gross lesions. Most of these are good and well selected though a few represent very questionable examples of the lesions. For instance fig 32, replacement fibrosis of the myocardium, appears in the picture to be a healed infarction, and fig 196, intradural round cell sarcoma, is probably a spinal cord covered by metastases from a medulloblastoma. A valuable addition is a chapter devoted to various types of poisoning and the anatomical lesions caused by each. There is a discussion of the medicolegal autopsy and the preparation of material for presentation at court. The book is intended as a guide for work in the autopsy room. References to important and comprehensive articles concerning the conditions dealt with throughout the book would greatly enhance its value. If there were discussions of etiology and pathogenesis included, the value of the book would be greatly enhanced for students in pathology. As it is, the book is worth while recommending for collateral reading in a course in pathology for students who can afford the purchase of an extra book or two. It does not, and is not intended to replace textbooks with more complete discussions especially in the relation of structural changes to altered function. For beginners in postmortem work and for physicians who have had a limited experience but who are occasionally called upon to make postmortem examinations, this book is probably the best of any in English. On the whole considering its size (700 pages) it is a noteworthy achievement.

**A B C of the Endocrines.** Jennie Gregory 126 pp Baltimore The Williams & Wilkins Company \$3.00

This very ingenious and quite amusing book consists of an attempt to depict the action and interrelation of the various endocrine glands by means of schematic diagrams. It is in the style so popular now, of the pamphlets produced by various drug houses to advertise their endocrine products. The book was written to be a useful addition to the library of the medical student and general practitioner, of workers in physiology and biology generally and of the intelligent general reader. In the opinion of your reviewer it is on the shelves of the last group only that the book deserves a place. The individual actually taking care of patients and giving opinions concerning endocrine matters must not depend on kindergarten charts for his knowledge. The author is to be congratulated on her ability in carrying through her project. The feasibility of her project however remains a question.

**Food, Fitness and Figure** Jacob Buckstein 252  
pp New York Emerson Books Inc \$2 00

After reflecting on the title one peruses this book with the expectation of finding it like many others but is agreeably surprised to discover that it is not, and instead is absorbingly interesting. This is because the subject matter is often illustrated by the relation of historical incidents and scientific anecdotes. One of these refers to Eljkmann's discovery of the cause of beriberi. The doctor, stationed in a prison camp in Java, hired a native boy to feed his pigeons and from time to time gave him money to buy rice for this purpose. The boy however, got the steward of the camp to give him the rice and put the money in his pocket. This rice was polished and the birds, like the inmates of the camp soon developed beriberi. When the disease among the birds was at its height, the steward went away on leave and the boy was obliged to buy rice in the market. This happened to be unpolished and when it was fed most of the birds recovered. While such anecdotes make the text entertaining, there is besides real substance in the subject matter as such chapters as 'The Human Machine', 'Food and Physical Development', 'How the Vitamins Guard Our Health', 'The Story of Milk, Cheese and Butter', 'The Normal Diet', 'Fad and Fancy about Food', 'Vegetarianism', 'Fasting' and 'The Problem of Weight Control' indicate. In the appendix the meals to consume to lose, to maintain or to gain in weight are recorded for a fortnight as well as the customary charts and tables of food values and the standard weights of men and women. While the book was written primarily for the faithful nurses, medical students and physicians should find it entertaining and instructive, and it should enhance the library of every dietitian.

**Roentgenographic Technique** A Manual for Physicians, Students and Technicians Darmon Artelle Rhinehart Second Edition Thoroughly Revised 431 pp Philadelphia Lea & Febiger \$5 50

This the second completely revised edition represents a modern conception of roentgenographic technique and roentgen ray machines. The author presents experiments and complete explanations of physical factors so that the technician or physician may readily understand why certain procedures for the production of the best roentgenograms are advisable and be able to carry them out. Since the technical problems are intimately related to disease conditions some of the more important of these are accurately but briefly discussed. The methods of preparing patients for the various examinations and the step by step procedures for doing them will be found especially valuable aids to those who are not already thoroughly experienced.

This volume of 431 pages and 183 illustrations fills the gap between the textbooks on roentgenography and some of the more readily usable, but inadequate small volumes on roentgenographic technique.

**Transactions of the American Association of Genito-Urinary Surgeons** Volume XXVIII 428 pp  
Saint Paul and Minneapolis The Bruce Publishing Company

These transactions are composed of thirty-one original papers and discussions on them, given by the members of this senior society (about sixty active members) of the genito-urinary surgeons of the United States of America and Canada at their annual meeting in 1935.

The papers run the gamut of genito-urinary surgery from reports of rare or interesting cases the like of which might never be encountered in a lifetime of practice, to papers which are thoughtful steps in the investigation, analysis and elucidation of general principles of fundamental importance. A good example and the paper which made the greatest appeal to the reviewer was one which showed in a convincing manner the destructive late effects of severe injuries to the kidney and emphasized the advisability of subsequently studying all cases of suspected kidney injury and if a persisting abnormality was found, considering operation strongly, in order to avoid the late effects which were shown to be destructive to the kidney.

Taken as a whole these transactions represent the best thoughts of the year of this group of leaders of genito-urinary surgery in America, in which country it is admitted to have attained its highest degree of specialization and development.

**The Surgical Clinics of North America** Volume 16, Number 1 Chicago Number, February 1936 356 pp Philadelphia and London W B Saunders Company

The leading feature of this issue is a symposium of seven clinics dealing with the various aspects of cancer of the cervix. Generally approved methods of diagnosis and treatment are presented. A discussion of manipulative surgery with special reference to low back pain and symptomatic sciatica is ably presented by Lewin. He has obtained excellent results in various low back difficulties by manipulation under general anesthesia. The twenty other clinics give concise, practical information on conditions of common occurrence in surgical practice.

**The International Medical Annual** A year book of treatment and practitioner's index Edited by H Letbeby Tidy and A. Rendie Short. 555 pp Baltimore William Wood & Company \$6 00

This volume of 555 pages represents the work of thirty-six leading British physicians who have gleaned the essentials from the medical literature of the year. The material is arranged in encyclopedic form and a general index follows so that it is readily available for quick reference. The generous use of illustrations adds greatly to its value.

# The New England Journal of Medicine

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NUMBER 9

## SUCCESSFUL TREATMENT OF BRUCELLA MENINGITIS WITH IMMUNE HUMAN SERUM ISOLATION OF THE ORGANISM BY A MODIFIED CULTURAL METHOD\*

BY MARY A. POSTON† AND DAVID T. SMITH, MD†

TWO cases of meningitis due to *Brucella abortus* have recently been observed which are of especial interest in that the patients were treated intrathecally with fresh human immune serum and isolation of the organisms from the spinal fluid was accomplished by means of a special technic described below

Hughes<sup>1</sup> in 1897 observed meningeal symptoms in a patient with Malta fever and succeeded in isolating *Micrococcus melitensis* from the meninges at necropsy. Lemaire<sup>2</sup> in 1924 was successful in obtaining a culture of *Brucella melitensis* from the spinal fluid of a patient with meningitis. Since then brucellae have been isolated from ten patients with meningeal involvement.<sup>3 4 5 6 7 8 9 10 11</sup>

DeJong<sup>11</sup> described a case of meningitis due to the bovine variety which was treated with three intravenous injections of a commercial polyvalent antibrucella serum (bovine variety). There was "little objective improvement" following serum therapy.

CASE 1 Mrs E. I., No 60694 a white textile worker of 50 years was admitted to the Duke Hospital November 11, 1935, with the complaint of chills fever headache and nausea of nine weeks duration. The onset of her illness was sudden. She was awakened in the middle of the night by a severe chill followed by headache nausea vomiting and aching in the back of the neck, along the spine and in the legs. During the first two weeks of the disease these symptoms recurred every third night. The vomiting was not projectile and there was no evidence of involvement of the central nervous system. Four days after the onset she was referred to the Hugh C.atham Memorial Hospital Elkin North Carolina by Dr Hugh Parks. While there she gradually became jaundiced the white blood cell count rose to 27,000 per c. mm. and localizing signs developed in the upper right quadrant of the abdomen. At operation a strawberry type gallbladder was removed by Dr C. L. Hawwood Jr. who noted a local brownish discoloration of the liver. Following cholecystectomy there was some improvement in the patient's condition with a drop in the white blood cell count to 18,000 per c. mm. Five days later the headache nausea intermittent chills and fever reappeared. No malarial parasites could be demonstrated in the blood. Two weeks before

admission to the Duke Hospital (seven weeks after onset) the neck became stiff. Three successive lumbar punctures revealed a cloudy fluid a pressure above 200 mm. of water and 500 to 1000 leucocytes per c. mm. with a preponderance of polymorphonuclears. No organisms were found on smears and no growth appeared in cultures.

Examination on admission revealed a fairly well nourished, co-operative, but very lethargic woman. Her neck was stiff, Kernig's and Brudzinski's signs were present, with the abdominal reflexes absent. Vision was good there was no choking of the optic discs and the other cranial nerves were intact. The tendon jerks were active and equal there was no motor or sensory loss. Babinski's sign and clonus were absent. The lymph nodes and spleen were not enlarged and there were no other abnormal findings. There was no anemia and the red cells showed no parasites or other abnormalities. The blood leucocyte count was 18,000 per c. mm. with 90 per cent polymorphonuclears (44 per cent nonsegmented forms). A blood Wassermann test was negative, the stool was negative for occult blood and parasites, the urine was negative except for a trace of acetone.

Lumbar puncture revealed cloudy fluid with an initial pressure of 100 mm. of water. There were 925 leucocytes per c. mm. with 86 per cent polymorphonuclears and 14 per cent mononuclears. Pandy test 1+. The smear showed two small gram negative coccobacilli. The Wassermann and colloidal mastic tests were negative. Two days later the initial pressure of the spinal fluid was 80 mm. and the cell count 110 per c. mm. with 40 per cent polymorphonuclears and 60 per cent mononuclears. Pandy test 3+. *Brucella abortus* was cultured from this fluid using the special technic to be described presently.

The organism was agglutinated by our stock antibrucella (bovine) rabbit serum in a dilution of 1:250. Through the courtesy of Dr Edward Francis the organism was studied at the National Institute of Health Washington and found to be agglutinated by bovine antiserum in a dilution of 1:2560.

The patient continued to have headache vomiting and an undulating type of fever. On November 15 four days after admission more spinal fluid was removed and again a positive culture was obtained. At this time 16 cc. of fresh human immune serum\* were introduced intrathecally. The serum used agglutinated the organism isolated from the patient's spinal fluid in a dilution of 1:320 and killed it in a dilution of 1:1000. This treatment was repeated on November 17, 18 and 20 a total of 74 cc. of serum being given. The spinal fluid

From the Departments of Bacteriology and Medicine Duke University School of Medicine Durham North Carolina.

†Poston Mary A.—Assistant in Bacteriology Duke Hospital 1930. Smith David T.—Bacteriologist and Associate Physician Duke Hospital 1930. For records and addresses of authors see This Week's Issue page 493.

\*The serum used for treatment was obtained from one of us (M. A. P.) who had been immunized eight years previously to multiple strains of all three varieties of brucella with no subsequent injections of vaccine. During the past eight years about fifteen strains of this organism which we have isolated have all been agglutinated by this serum.

after treatment was no longer cloudy no growth was obtained and the total cell count fell to 36 per c mm, with a decrease in polymorphonuclears and a corresponding increase in mononuclears. This change was accompanied by striking clinical improvement. Following the first treatment, the patient's temperature fell to normal and remained normal. All signs of meningeal irritation disappeared two days after the last injection.

At no time was any growth of brucella obtained from the blood, urine or feces, and the patient's serum never agglutinated her own or stock organisms. An autogenous vaccine was prepared from the cultures isolated from the patient. After six subcutaneous injections of the vaccine totaling 5 cc, the patient's serum agglutinated her own and stock antigen in a dilution of 1:80. The patient was discharged November 27, 1935, symptom free.

**CASE 2.** This was a girl of 7 years who had had symptoms of a low grade meningitis for a month and had been treated at home by her family physician. Following two lumbar punctures she was partially relieved of symptoms for a period of ten days. The spinal fluid from the first puncture contained gram negative bacilli which resembled *Hemophilus influenzae*, but cultures by ordinary methods were negative. The second fluid revealed no organisms in smear and no growth was obtained. The symptoms soon returned and the patient was admitted to the Duke Hospital on January 6, 1936.

*Brucella abortus* was isolated from the spinal fluid taken at the Duke Hospital and complete recovery followed intrathecal injections of the same human immune serum as was used in case 1. The serum agglutinated this strain of brucella in a dilution of 1:640. A series of injections of autogenous vaccine was given to prevent a relapse. The details of this case will be reported elsewhere.<sup>12</sup>

Amoss and Poston<sup>13</sup> have described an agglutination technique by which they were able to obtain positive cultures of brucella from the feces. The same principle was utilized in culturing the spinal fluids from the two cases described above.

One cc of a 1:100 dilution of inactivated polyvalent anti-brucella rabbit serum was mixed with 5 cc of the spinal fluid and incubated for one half hour. The spinal fluid serum mixture was then centrifuged at high speed for fifteen minutes and the sediment planted on liver infusion blood agar slants and grown at 37° C under increased carbon dioxide tension. To accomplish the latter, the upper portion of the test tube was heated in the flame to force out some of the air, the expired breath of the bacteriologist was blown into the tube through a sterile plugged pipette and a rubber stopper immediately inserted.

Growth appeared in tubes inoculated from

the mixture of spinal fluid and serum within twenty-four hours, whereas cultures of the untreated spinal fluids, some of which were centrifuged, showed no growth on the same medium until after seventy-two hours.

Brucella infection should be suspected in cases of atypical meningitis. Brucella meningitis can be treated by human immune serum obtained from individuals, who have been actively immunized to brucella, or possibly from convalescent cases in the community, who have high agglutinating titers in their blood serums for the specific organism isolated from the spinal fluid.

Patients who have no agglutinins for brucellae in their blood after recovery should be immunized with their own organism to prevent a recurrence of the infection.

#### SUMMARY

1. A method of culture is described in which *Brucella abortus* can be grown after being precipitated by specific agglutinating serum.
2. Two cases of brucella meningitis are discussed that recovered rapidly and apparently completely after intrathecal treatment with fresh human immune serum.
3. In the absence of subsequent active immunity, such an immunity was induced by autogenous vaccine therapy.

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# Massachusetts Medical Society

## PROCEEDINGS OF THE SOCIETY

*First Day June 8 1936*

**T**HE one hundred and fifty-fifth anniversary was observed in Springfield on June 8 and 9 and 10, 1936. The headquarters were maintained in the Municipal Auditorium and all of the scientific meetings were held and all exhibits shown in this building. The meeting of the Council, the Annual Dinner and the Annual Meeting of the Society were held at the Hotel Kimball. A series of demonstrations and clinics was held in each of the hospitals in Springfield.

On Monday morning June 8 the Section of Dermatology and Syphilology met in the Mahogany Room of the Auditorium. The officers of the Section were Dr. Harvey P. Towle of Boston, Chairman, and Dr. Rudolph Jacoby of Boston, Secretary. The attendance was 102. At the business meeting the following officers were elected for the ensuing year:

*Chairman* C. Morton Smith, Boston  
*Secretary* J. Harper Blaisdell, Winchester and Boston

Monday afternoon the Section of Obstetrics and Gynecology met in the Lower Section Room of the Auditorium. The officers of the Section were Dr. Charles J. Kichham of Brookline, Chairman, and Dr. Raymond S. Titus of Boston, Secretary. The attendance was 170. At the business meeting the following officers were elected for the ensuing year:

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At 4:00 o'clock a "Kicker's" Golf Tournament open to members of the Massachusetts Medical Society and their guests was held at the Springfield Country Club. This was conducted under the auspices of the local chairman, Dr. Richard A. Rochford. In addition to the prizes contributed by exhibitors and friends of the Society, there was a substantial cash dona-

tion from a sister society which was used for the purchase of appropriate cups.

Monday evening the Shattuck Lecture was delivered by Dr. George Blumer, David P. Smith, Clinical Professor of Medicine at Yale University Medical School, on the subject of "Trichinosis, with Special Reference to Changed Conceptions of the Pathology and Their Bearing on the Symptomatology." (This paper appeared in *The New England Journal of Medicine*, issue of June 18.) Following the lecture, light refreshments were served in the Good-Fellowship Room.

*Second Day, June 9, 1936*

Tuesday morning the Section of Surgery met in the Lower Section Room of the Auditorium. The officers of the Section were Dr. E. Parker Hayden of Boston, Chairman, and Dr. Frederick S. Hopkins of Springfield, Secretary. The attendance was 200. At the business meeting the following officers were elected for the ensuing year:

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At 5:00 o'clock all members of the medical profession were invited to attend a Symposium on Medical Economics sponsored by the Public Relations Committee of the Massachusetts Medical Society. The round table discussion was opened by Dr. Charles E. Mongan, President of the Society, who recalled the history of certain movements at home and abroad which affect the economic status of the physician. Particular reference was made to the implication

after treatment was no longer cloudy no growth was obtained and the total cell count fell to 36 per c mm., with a decrease in polymorphonuclears and a corresponding increase in mononuclears. This change was accompanied by striking clinical improvement. Following the first treatment, the patient's temperature fell to normal and remained normal. All signs of meningeal irritation disappeared two days after the last injection.

At no time was any growth of brucella obtained from the blood, urine or feces, and the patient's serum never agglutinated her own or stock organisms. An autogenous vaccine was prepared from the cultures isolated from the patient. After six subcutaneous injections of the vaccine totaling 5 cc., the patient's serum agglutinated her own and stock antigen in a dilution of 1:80. The patient was discharged November 27, 1935, symptom free.

**CASE 2** This was a girl of 7 years who had had symptoms of a low grade meningitis for a month and had been treated at home by her family physician. Following two lumbar punctures she was partially relieved of symptoms for a period of ten days. The spinal fluid from the first puncture contained gram negative bacilli which resembled *Hemophilus influenzae*, but cultures by ordinary methods were negative. The second fluid revealed no organisms in smear and no growth was obtained. The symptoms soon returned and the patient was admitted to the Duke Hospital on January 6, 1936.

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# Massachusetts Medical Society

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of the Complete Social Security Plan which was originally designed to include provision for Compulsory Health Insurance. Apparently the profession has been thoroughly aroused on this point, and while it will welcome a plan which will promote the public good, it will resist vigorously any attempt to alter the voluntary and personal relations between patient and physician. There was considerable discussion of the activities of the Committee on Public Relations which through its subcommittees has done much to inform the public and to study the actual question of the adequacy of medical care in this state.

Those participating included Dr Michael Tighe of Lowell, Dr Ralph R Stratton of Melrose, Dr Victor Bychower of Malden and Dr E L Hunt of Worcester.

The attention and interest of the 150 physicians attending the symposium were remarkable. The session lasted one hour and fifteen minutes.

The Annual Dinner was served in the Banquet Hall of the Hotel Kimball at 7 00 o'clock. There were approximately 371 people in attendance. Following the invocation by the Reverend Father John J O'Connor, of Northampton, the President, presented His Honor, Henry Martens, Mayor of Springfield who welcomed the Society to the celebration of the Three Hundredth Anniversary of Springfield. The President next presented the other officers of the Society and the past presidents who were at the dinner. Dr Henry Jackson of Boston was introduced and a tribute paid to him for his long and successful medical career. There were two guests from abroad, Dr Charles M Lilley of Brisbane and Dr A Britten-Jones of Adelaide, Australia. Representative Emma E Brigham spoke briefly concerning legislative activities of the Society during the past year and complimented the Society upon the completion of a successful program. Mrs Brigham was a valuable aid in securing these successful results. Dr Roger I Lee spoke briefly as the Trustee of the American Medical Association and commented upon the prominent part which Massachusetts plays in the national organization.

The President next presented the guest speaker of the evening, the Reverend Michael J Ahearn, S.J. Father Ahearn, who is Professor of Chemistry and Geology at Weston College and a scientist of international reputation, spoke entertainingly concerning a recent trip, under the auspices of the National Council of Jews and Christians, which was organized for the purpose of promoting tolerance among religious sects.

The benediction was pronounced by the Reverend Percy T Edrop, Dean of Christ Church, Springfield.

Following the Annual Dinner there was dancing in the Ballroom.

### Third Day, June 10, 1936

Wednesday morning the Section of Pediatrics met in the Lower Section Room of the Auditorium. The officers of the Section were Dr George P Hunt of Pittsfield, Chairman, and Dr James M. Baty of Belmont and Boston, Secretary. The attendance was 150. At the business meeting the following officers were elected for the ensuing year.

*Chairman*, J Herbert Young, Newton and Boston.

*Secretary*, James M Baty, Belmont and Boston.

At the same time the Section of Tuberculosis met in the Mahogany Room of the Auditorium. The officers of the Section were Dr Donald S King of Boston, Chairman, and Dr Olin S Pettingill of Middleton, Secretary. The attendance was 125.

At the business meeting the following officers were elected for the ensuing year.

*Chairman*, Olin S Pettingill, Middleton.

*Secretary*, Theodore L Badger, Brookline and Boston.

Surgical Dry Clinics were conducted at the Springfield, Wesson Memorial, Shriners' and Mercy Hospitals.

Operative Clinics were held each morning during the meeting at 8 00 o'clock at the Mercy, Shriners', Springfield and Wesson Memorial Hospitals.

### ANNUAL MEETING

The Annual Meeting of the Massachusetts Medical Society was held in the Main Dining Room, Hotel Kimball, Springfield, on Wednesday, June 10, 1936, at 12 o'clock noon. The President of the Society, Dr Charles E Morgan, presided and the Secretary, Dr Alexander S Begg, was present.

The meeting was called to order and the President announced that the minutes of the previous meeting had been published in the issue of *The New England Journal of Medicine* for August 1, 1935 and that if there were no corrections he would declare them approved as published.

The Secretary reported on changes of membership for the year.

### CHANGES IN MEMBERSHIP

Membership Reported June 5, 1935— 5016

#### Losses

Deaths	85
Resignations	25
Deprivations	42
	152

#### Gains

New Fellows	244
Readmitted by Censors	4
Restored by Council	8
	256

Net Gain— 104

Membership Reported June 10 1936— 5120

Dr Bernard Zuckerman of Dorchester presented a resolution approving of a reorganization of medical care and practice so as to provide the service needed by the people and at the same time assure to the members of the profession economic security for the proper pursuit of their profession. This resolution was accompanied by a plan. The matter was referred to the Committee on Public Relations.

The President then declared the meeting to be in executive session and requested all persons not members of the Massachusetts Medical Society with the exception of the stenographer to withdraw from the meeting. He appointed Dr Conley of Malden to act as sergeant at arms. The President presented the report of the special committee consisting of the presidents of the eighteen district medical societies which was ordered at the last Annual Meeting of the Society. This committee was appointed to consider the findings of the Board of Trial and to recommend to the Society at this meeting such action as seemed to it just and necessary. The report of the committee recommends that the majority report of the Board of Trial in the case of Dr Nicandro F. DeCesare be approved. After considerable discussion a rising vote was called for and the report of the committee was approved and the findings and recommendations of the majority of the Board of Trial were adopted. The executive session was then dissolved by the President and the regular order of business was resumed.

Dr William R. Morrison of Suffolk, on behalf of the Committee of Arrangements, extended thanks to the physicians, nurses and hospitals of Springfield as well as to the Mayor and citizens of the city for the cordial hospitality and assistance which had resulted in a most successful meeting. He likewise paid tribute to the effectiveness of Dr Allen G. Rice, Dr Theodore S. Bacon and Dr Hervey L. Smith and their associates on the Local Committee of Arrangements. He called attention to the excellent program of entertainment which had been provided for the ladies by Dr W. A. R. Chapin and Dr James A. Seaman and those associated with them. The President, Dr Mongan, asked that this be regarded as a resolution offered by Dr Morrison and called for a vote which appeared to be unanimous.

Dr William H. McBain of Middlesex South next offered the following resolution which was duly seconded by Dr Bigelow and unanimously accepted:

*Mr. President and Fellows of the Massachusetts Medical Society*

I wish to offer a resolution

Whereas The 155th Annual Meeting of the Massachusetts Medical Society now drawing to a close will take its place as the equal of any of the numerous instructive and entertaining meetings which have preceded it it is now fitting that the Society show

its appreciation of the vast amount of work necessary for the proper planning and the successful consummation of those plans.

Therefore be it resolved That the Massachusetts Medical Society is deeply grateful to Mr Robert St. B. Boyd our Executive Assistant to our own admirable Committee of Arrangements to the Chairmen and Secretaries of the various Sections to all who have entertained us by their valuable and instructive papers in the different Sections to all those who, with much labor and expense, have given us such outstanding Scientific Commercial Medico-Historical and the Hobby Show Exhibits, to the management and the staffs of the fine hospitals of which Springfield may well be proud, to the Mayor of Springfield for his gracious words of welcome to the Reverend Father Ahearn, who in his inimitable manner, so delightfully entertained us and at the same time gave us such sane counsel regarding one of the most vexing problems confronting the world today to the management and the employees of the Kimball Hotel and the Municipal Auditorium, to whom no small part of the success of this meeting has been due and to our President Dr Mongan, and our Secretary Dr Begg both of whom have been untiring in their efforts throughout the year to continue the high standing which the Massachusetts Medical Society has attained.

Dr Allen G. Rice of Hampden asked Dr Hervey L. Smith of Springfield to say a word to the Society. His remarks were as follows:

"Mr. President and Fellows, the Local Committee have been showered with congratulations and praise, and not one word of criticism or complaint has come to our ears. For this we are very grateful. But there is one man little known to you who contributed greatly to the success of this meeting, and to that man, Mr. Boyd, the Hampden District Medical Society wants to offer its heartfelt thanks for the splendid job he has done." The President commented that the applause indicated that the Society agreed with the speaker.

The President then proceeded to render his report on the state of the Society.

*To the Members of the Massachusetts Medical Society*

Section 1 of Chapter 2 of the By-Laws of the Massachusetts Medical Society directs that the President shall render a report on the state of the Society at the Annual Meeting. In accordance with this request, I most respectfully submit for your consideration a report on the state of this Society.

The past year has been one of great activity on the part of the Massachusetts Medical Society. Many questions of interest to the Society have been considered, questions which concern the individual members of the Society, questions which concern the Society as a whole, medical questions the solution of which concerns the community at large, and also the matter of postgraduate instruction. As the years go on the study of medical economics will become more and more important. It is fitting that each member of the Society should make an intensive study of medical economics. On the proper solution of the problems in the field of medical economics depends the very existence of our Society as now constituted and the professional standing of the individual physician.

The most important question that came under consideration by our Society this year was the bill introduced into the Legislature which had for its

object the raising of the standards for medical education as applied to the registration of physicians. This bill places the responsibility for educational standards in the hands of a newly created board consisting of the Commissioner of Education, the Commissioner of Public Health and the Secretary of the Board of Registration in Medicine and it covers premedical as well as medical instruction. For years the Medical Society has been endeavoring to bring about this result. I am happy to inform you that at last a bill, which is satisfactory to our Society, has been passed by the Legislature and signed by the Governor. I am of the opinion that it will place no hardship on any medical school to meet the fair requirements which are demanded by this law. All medical schools will have until 1939 to comply with the law.

The passage of this law was attended by long discussions in the Legislature. The bill was fully discussed and frequently amended, especially in the Senate. The Legislature approved the bill by a large majority. The bill was sent to the Governor for his signature. Governor Curley, at a conference with representatives of your Society and representatives from two medical schools, suggested a further amendment to the bill. This suggestion of the Governor's was accepted by all at the conference. The bill with the suggested amendment was returned to the Legislature and was passed with but little discussion, returned to the Governor, was signed by him and is now a law.

This great work was not accomplished without study and hard work by the Executive Officers of your Society and the Committee on State and National Legislation. The work of these bodies would have been of no avail if it had not been for the generous support and backing of the rank and file of the Society. Your President is happy to say that no request that he made for aid and assistance in this work from any member of the Medical Society was denied. In fact, the loyalty and the willingness of each member to do his part were the most encouraging phases in securing this legislation. This accomplishment, I hope in future years will be an inspiration to our Fellows.

It is my pleasure also to say that on the part of the members of the Medical Society no harsh or acrimonious words were used in securing this legislation. In fact your officers believe they have brought about between the Society and the members of the Legislature an era of goodwill and proper understanding.

Allow me to pause to emphasize two facts. The Massachusetts Medical Society from its very beginning in 1781 has stood for high standards in medical education and practice. Secondly, it has not deviated in the least from that standard nor broken its faith in dealing with the people under its charter. One of the requirements under the charter given to the Society in 1781 was this: that every person who presented himself for membership in the Massachusetts Medical Society was obliged to take an examination under the supervision of the censors. The same rule still prevails. Until 1891 anyone might set himself up as a practitioner of medicine in Massachusetts but not every one would be allowed to join the Massachusetts Medical Society unless he proved himself fit by passing a proper examination. From 1781 until 1894 the only guarantee of good medical practice the people of Massachusetts had was that furnished by the members of the Massachusetts Medical Society. For 113 years this Society was a guarantee that its members were fit to give adequate medical service to the community. We have not changed our ideals or our standards. We pray to God we never shall.

One of the most important works of the Society has been undertaken by the Committee on Public Relations. This Committee has had many meetings during the year. The attendance of the members has been quite unusual. I think it has been about 80 per cent.

I wish to call your attention especially to the work of the Subcommittee on Social Insurance, of which Dr M A Tighe of Lowell has been Chairman. Under Dr Tighe's leadership, local committees whose work is to bring before the people of Massachusetts the matter of social insurance, have been formed. Many meetings before lay bodies and medical societies have taken place throughout the Commonwealth. Lay clubs have received your speakers with great consideration. Newspapers have given space and favorable reports in towns and cities where these talks have taken place. It remains for the Society itself to carry on this great work of education. The success of this campaign of education lies squarely on the individual members of the Society. Its responsibility cannot be dodged. Your President believes that if the people of Massachusetts are made thoroughly acquainted with the origin, the aims and the objects of social security as it affects them and their medical advisers with all its implications, there will be only one answer and that answer will be that the people of Massachusetts will reject lay and political domination of the medical profession.

Under the Chairmanship of Dr E L Hunt of Worcester, a partial survey of the adequacy of medical care has been made. Dr Hunt and his Committee have worked assiduously. Their survey indicates that the study should be carried farther. The reports of these two Committees have been published in the *Journal* and merit your serious consideration.

Many conferences have been had, although informal, with representatives of insurance companies. It has been the special endeavor of Dr Blaisdell of the subcommittee on insurance to bring about an understanding by which the rights of the physician shall be guaranteed not only under the Workmen's Compensation Law but also under the Compulsory Automobile Insurance Act. Both these questions involve many complications. I would bespeak for the Committee your confidence and patience and your support if called upon to give it.

Other subcommittees of the Public Relations Committee have been doing excellent work. The abuse of clinics has been under the consideration of the subcommittee presided over by your Vice-President Dr Frothingham. This Committee has also had to do with the matter of immunization. The Committee has submitted a plan which appeared in the *Journal* of March 12, 1936 page 524.

On November 27 the Society gave a reception to Dr James S McLester, President of the American Medical Association and Dr J Tate Mason, President Elect of the American Medical Association at the Harvard Club in Boston. This meeting was attended by the Executive Officers by members of standing committees and by the Presidents and Secretaries of the District Societies. The good results of this meeting will be shown in the future.

According to the custom of the Society the President has made a visit to sixteen of the eighteen District Societies. There was a large attendance at each of these meetings. It was stated by those in position to know that all these meetings had increased attendance and some had at least doubled the attendance of former occasions of a similar nature. The President desires to thank all for the courtesies that have been extended to him. Everywhere throughout the State he has found co-operation. The manifest and enthusiastic interest on

the part of the members has been an inspiration to him in carrying out the work of the Society. It has made his work lighter and his burden not heavy. There have been most cordial relations between the President and the members of the standing committees. There has been willing co-operation on the part of all officers and committees. The Editor of the Journal has been ready and willing at all times to give his assistance in furthering the good work of our organization.

May I also pause to call your attention to the work of the Committee of Arrangements. It has done a good work in co-operation with the excellent local committee of the medical fraternity of Springfield as you have found out in your visit to the scientific and business exhibits that have been arranged under their supervision. The social program which has been arranged for your entertainment by the Women's Auxiliary Committee of Springfield merits our sincere thanks.

May I also call your attention to the good work of the Secretary, Dr. Begg. He has been a wonderful assistant to the President. Graciously he has been ever ready to respond at any hour of the day to any request made by the President. I will pause here and ask you to rise in recognition of the ability, the loyalty and the good work of the Secretary.

I also wish to mention the work of the Committee on Postgraduate Instruction. Postgraduate instruction has been carried on in this state now for three years. The attendance during the past year has not been so large as that of the two former years. On the whole I think it is a most interesting and effective way of furnishing perhaps indirectly an adequate and proper medical service to the community. Every member should take a personal interest in the matter of postgraduate instruction. As your President sees it this activity is going to be one of the most potent factors in convincing the people of Massachusetts that their medical society is ready at all times to give adequate medical service. But the accomplishment of this adequate medical service cannot be attained unless every member of the Society takes an active interest in the cause. Regardless of your age and experience you may learn much from the excellent program which the Committee on Postgraduate Instruction furnishes. It has been said that the people of Massachusetts should be particularly informed about this activity of your Society and further there is no similar organization for postgraduate instruction existing in any other state.

The next year will present to you many medical problems. Besides the question of medical economics there also looms the question of relationship of our Medical Society with the public health service. It will be the endeavor of your President to co-operate so far as it is possible with all public health authorities in the domain of public health always with the idea of preserving the rights and privileges of organized medicine and at the same time to recognize that public health has its field with its rights responsibilities and privileges. I see no reason why both organized medicine and public health authorities should not walk hand in hand with the dominant idea in the minds of both the health of the people of the Commonwealth.

At 1 00 p m the President introduced the Orator, Dr. Reginald Fitz. He stated that Dr. Fitz needed no introduction but that he took delight in presenting him because of the great debt that he owed Dr. Fitz's father who was his teacher in pathology. He spoke feelingly of the character and ability of the elder Dr. Fitz and stated that in his opinion he was one

of the greatest pathologists that medicine has produced. It was with pleasure, therefore he presented the son, Dr. Fitz, who proceeded to deliver the Annual Discourse.

The meeting adjourned at 1 50 p m.

Following the Annual Discourse, luncheon was served in the Main Dining Room. The total registered attendance for the three-day meeting was 909.

ALEXANDER S. BEGG  
*Secretary*

The Commercial Exhibits were well arranged and were well attended by the Fellows and great interest was shown in the excellent series of Scientific Exhibits which had been arranged by the Committee.

Much credit for the social calendar for the ladies must go to the Committee on Ladies' Program which was made up as follows:

Chairman, Dr. W. A. R. Chapin

Co-Chairman, Mrs. James A. Seaman

Mrs. T. S. Bacon Mrs. R. S. Benner Mrs.  
J. M. Birnie Mrs. L. D. Chapin Mrs. J. B.  
Comins Mrs. G. B. Corcoran Mrs. J. E.  
Dwyer Mrs. F. Hagler Mrs. M. F. Hosmer,  
Mrs. C. F. Lynch Mrs. A. G. Rice, Mrs.  
F. B. Sweet.

Under the auspices of this group the following program was provided:

#### MONDAY, JUNE 8

3 p m - 5 p m—Tea at the George Walter Vincent Smith Art Gallery, 222 State Street, Springfield.

8 15 p m—Shattuck Lecture by Dr. George Blumer, New Haven, Ballroom, Hotel Kimball.

#### TUESDAY, JUNE 9

10 a m—Tour of surrounding country including college towns of Amherst, Northampton and South Hadley.

Noon—Luncheon at the Springfield Country Club to meet the wives of the Presidents of the District Medical Societies.

Golf Tournament at Springfield Country Club after luncheon.

Tour of Springfield museums for those not playing golf.

7 00 p m—Dinner at Hotel Kimball (Followed by entertainment and dancing).

#### WEDNESDAY, JUNE 10

10 a m—Visit to Springfield hospitals.

ADMISSIONS RECORDED FROM JUNE 5 1935  
TO JUNE 10 1936

This list appeared in the issue of August 6 on page 259.

## DEATHS REPORTED FROM JUNE 5, 1935 TO JUNE 10, 1936

Admitted	Name	Place of Death	Date of Death	Age
1907	Adler Herman Morris	Boston	December 7 1935	59
1926	Bacon, John Lowell	Frammingham	November 21 1935	59
1878	Bacon Jonas Edward	Brockton	July 31, 1935	82
1882	†Baker, Harry Beecher	Taunton	June 7, 1936	77
1888	Baldwin, Frederick Willam	Beverly	March 7, 1936	74
1907	Ballou, Ambrose Roche	Dorchester	December 4 1935	54
1917	Barnes Frederick Rigby	Fall River	July 18 1935	46
1908	Barry, James Henry	Roxbury	September 23, 1935	65
1896	Bateman, Frank E	Somerville	April 5, 1936	69
1896	†Berry, John Cutting	Worcester	February 8, 1936	89
1878	†Bixby, Josiah Peet	North Woburn	September 2, 1935	80
1928	Bongiorno, Felice	Waltham	February 20, 1936	42
1898	Brown, Edward Wells	Northampton	October 25 1935	64
1901	Bryant, Frederick	Hull	July 29, 1935	64
1911	Bryant, John	Brookline	September 19 1935	55
1899	Buck, Manrice Allen	Billerica	November 19, 1935	61
1916	Butler, David Mathew	Cambridge	August 1, 1935	46
1886	Cahill, Charles Sumner	Cambridge	December 10, 1935	71
1891	Clancy, William Henry	Cambridge	September 21, 1935	70
1892	Clapp, Frank Horace	North Grafton	February 26, 1936	74
1895	†Cobb Carolyn Melville	Lynn	January 2, 1936	74
1898	Cronin, Thomas Joseph	Worcester	September 10, 1935	70
1905	Curran, Simon Francis	Dorchester	May 19, 1936	61
1887	†Curtis, Francis George	Ashfield	April 7, 1936	78
1877	†Davenport, Francis Henry	Boston	April 9, 1936	84
1924	Donahoe, Robert Abbott	Lowell	August 20, 1935	43
1914	Dowling John Joseph	Boston	July 10, 1935	65
1919	Ellis, Ralph Warner	Worcester	March 3, 1936	44
1912	Fallon Joseph Francis	Brookline	October 14, 1935	53
1895	Fosgate Elmer Gilman	Ashburnham	June 8, 1935	75
1910	Friedman, Nathan	Dorchester	October 3, 1935	51
1891	†Gale George Washington	Saugus	April 21, 1936	99
1881	†Goodell, George Zina	Salem	September 9 1935	76
1928	Goodwin Edward Everett	Boston	November 6, 1935	71
1921	Guidord, Alberta Sylvia Boomhower	Waban	May 27, 1936	62
1924	Hale, Edward Preston	Lenox	September 9, 1935	75
1896	Hanley, Francis Joseph	Whitman	August 2 1935	66
1914	Haskins Frank Eugene	Boston	May 24, 1936	61
1885	†Herrick, Joseph Thomas	Springfield	June 2 1935	76
1909	Howland Charles A.	Schenectady, N Y	December 28, 1935	58
1906	Hurley Edward Daniel	South Boston	June 8 1936	54
1892	†Jackson Charles William	Springfield	August 21 1935	83
1898	†Jones Mary Scott	Boston	June 16 1935	81
1922	Klein, Alvin Walter	Stockbridge	September 27, 1935	67
1884	†Knowles William Fletcher	Brookline	February 12 1936	74
1894	†Konikow Moses J	Brookline	April 26, 1936	68
1907	Lawlor Edward Francis	Lawrence	October 6 1935	58
1910	L Esperance, Oscar Raoul Talon	Centerville	July 15, 1935	57
1865	†Macdonald William Lewis	Malden	September 24, 1935	101
1915	Mahoney Francis X	Boston	January 14 1936	64
1907	Massé John Baptiste	Lawrence	October 15, 1935	59
1898	May, John Shepard	Jamaica Plain	October 10, 1935	65
1899	McAllister Frederick Danforth	Lawrence	March 17, 1936	63
1894	McEvoy Thomas Edward	Worcester	March 28, 1936	76
1912	McGraw, Andrew J	Taunton	April 20 1936	54
1902	McPherson Ross	New York, N Y	August 16, 1935	59
1898	McQuaid Thomas Bernard	Webster	September 19 1935	75
1912	Mindlin, Carl	Haverhill	August 20 1935	51
1891	†Morris, George Patrick	South Boston	January 4, 1936	75
1907	†Morrison Archibald Benjamin	Brookline	May 3 1936	73
1913	Murphy John Joseph	North Conway, N H	July 8, 1935	49
1898	Murphy Timothy Joseph	Roxbury	January 1 1936	69
1920	Nicholson Minnie J	Haverhill	August 31 1935	59
1886	†Norton Eben Carver	North Chatham	April 11 1936	79
1893	O Connor, James B	Lowell	December 22 1935	67
1907	†Packard, Horace	Stoughton	January 24, 1936	80
1928	Packer George William	Fall River	March 4, 1936	56
1892	†Phelps, Olney Windsor	Warren	December 2, 1935	87
1928	Pollano Walter A.	Lawrence	June 25 1935	56
1925	Reynolds John Timothy	Boston	April 28 1936	54
1898	Ring, Arthur Hallam	Arlington Heights	June 25 1935	61
1897	Roberts, Frederick Alpha	Pittsfield	November 30 1935	72
1893	†Robinson, William Henry	Jamaica Plain	September 28 1935	67

1904	Shaw John Port	Brockton	June	5	1935	76
1929	Sisson Mitchell	Boston	June	1	1936	48
1882	Smith George Carroll	Brookline	February	8	1936	82
1911	Smith Duncan Campbell	Brookline	June	11	1935	50
1928	Spalding Harry Osgood	Boston	May	10	1936	65
1885	Swan William Donnison	Annisquam	June	25	1935	76
1889	Thomas John Jenks	Boston	July	17	1935	74
1901	Trainor, John Brett	Fall River	September	20	1935	67
1897	Upton Charles Lons	Greenfield	May	26	1936	65
1870	Wheeler Leonard	Worcester	October	2	1935	90
1922	Wight, Freeman Clark	Boston	August	4	1935	63
1897	Withee, Frederick Elmarian	Newton Highlands	June	30	1935	71

# OFFICERS OF THE MASSACHUSETTS MEDICAL SOCIETY FOR 1936-1937

ELECTED BY THE COUNCIL, JUNE 9, 1936

*President* Charles E. Mongan, Somerville, 24 Central Street.

*Vice President* Channing Frothingham, Boston Office, Jamaica Plain, 1153 Centre Street.

*Secretary* Alexander S. Begg, West Roxbury Office, Boston, 8 Fenway.

*Treasurer* Charles S. Butler, Boston, 257 Newbury Street.

*Orator* Joseph W. O'Connor, Worcester, 36 Pleasant Street.

## STANDING COMMITTEES FOR 1936-1937

### COMMITTEE OF ARRANGEMENTS

Horatio Rogers, *Chairman*, W. S. Burrage, R. P. Stetson, Augustus Thorndike, Jr., E. J. O'Brien, Jr.

### COMMITTEE ON PUBLICATIONS

R. I. Lee, *Chairman*, R. B. Osgood, R. M. Smith, F. H. Lahey, J. P. O'Hare.

### COMMITTEE ON MEMBERSHIP AND FINANCE

D. N. Blakely, *Chairman*, G. C. Caner, J. E. Fish, H. F. Newton, H. Q. Gallupe.

### COMMITTEE ON ETHICS AND DISCIPLINE

David Cheever, *Chairman*, A. C. Smith, R. L. DeNormandie, C. J. Kickham, R. R. Stratton.

### COMMITTEE ON MEDICAL EDUCATION AND MEDICAL DIPLOMAS

Reginald Fitz, *Chairman*, C. H. Lawrence, C. A. Sparrow, E. S. Calderwood, A. W. Stearns.

### COMMITTEE ON STATE AND NATIONAL LEGISLATION

C. E. Mongan, *Chairman*, F. E. Jones, A. W. Marsh, A. S. Begg, D. L. Lionberger.

### COMMITTEE ON PUBLIC HEALTH

R. P. Watkins, *Chairman*, Gerald Hoeffel, G. D. Henderson, S. C. Dalrymple, H. L. Lombard.

### COMMITTEE ON MALPRACTICE DEFENSE

F. G. Balch, *Chairman*, E. D. Gardner, F. B. Sweet, A. W. Allen, W. R. Morrison.

### COMMITTEE ON PERMANENT HOME

R. B. Greenough, *Chairman*, C. G. Mixter, J. M. Birnie, C. S. Butler, E. C. Miller.

## SPECIAL COMMITTEES FOR 1936-1937

### COMMITTEE ON CANCER

R. B. Greenough, *Chairman*, F. G. Balch, E. M. Daland, P. E. Truesdale, C. C. Simmons.

## REPRESENTATIVES TO THE MASSACHUSETTS CENTRAL HEALTH COUNCIL

On Administrative Board  
R. P. Watkins

### District Representatives

Eastern: E. P. Joslin, A. W. Dudley  
Northeastern: M. A. Tighe, F. W. Snow  
Southeastern: W. D. Kinney  
Central: G. D. Henderson, E. C. Miller  
Western: H. J. Downey, R. J. Carpenter

## COMMITTEE ON PUBLIC EDUCATION

(A subcommittee of the Standing Committee on Public Health)

R. P. Watkins, G. R. Minot, W. H. Robey, F. J. Cotton, F. C. Irving, R. M. Smith, E. H. Place, C. C. Simmons, J. H. Pratt, H. W. Stevens, J. B. Aver, H. P. Mosher, R. B. Osgood, F. R. Ober, E. P. Joslin, J. D. Barney, H. L. Lombard.

## COMMITTEE ON POSTGRADUATE INSTRUCTION

Frank R. Ober, *Chairman*, Boston, F. Denette, Adams, Boston, Roy Morgan, Westfield, John M. Birnie, Springfield, Harold L. Higgins, Boston, Joseph W. O'Connor, Worcester, Charles W. Blackett, Jr., Newtonville, Dwight O'Hara, Waltham, Reginald Fitz, Boston, Alexander S. Begg, West Roxbury, A. Warren Stearns, Billerica, Robert B. Greenough, Boston, Walter P. Bowers, Clinton, Henry D. Chadwick, Boston, Winfred Overholser, Boston, C. Macfie Campbell, Roxbury, Lincoln Davis, Boston, Leroy E. Parkins, Boston, *Secretary*.

## COMMITTEE ON PHYSICAL THERAPY

F. P. Lowry, *Chairman*, R. B. Osgood, G. R. Minot.

## COMMITTEE ON PUBLIC RELATIONS

One member appointed yearly by each District Medical Society.

The President of the parent society, Charles E. Mongan, is chairman.

### Barnstable District Medical Society

Merrill E. Champion, North Harwich.

### Berkshire District Medical Society

P. J. Sullivan, Dalton, 46 Courtis Avenue.

### Bristol North District Medical Society

Francis H. Dnnbar, Mansfield, P. O. address, Boston, 43 Bay State Road.

### Bristol South District Medical Society

Joseph A. Barré, Fall River, 1555 Pleasant Street.

### Essex North District Medical Society

Elmer S. Bagnall, Groveland, 251 Main Street, *Secretary*.



*Essex South District Medical Society*

John Joseph Egan Jr, Gloucester 52 Pleasant Street

*Franklin District Medical Society*

Halbert G Stetson, Greenfield 39 Federal Street

*Hampden District Medical Society*

Patrick E Gear, Holyoke 630 Dwight Street

*Hampshire District Medical Society*

Francis E O'Brien, Haydenville, Hampshire County Sanatorium

*Middlesex East District Medical Society*J Harper Blaisdell Winchester Office Boston  
45 Bay State Road*Middlesex North District Medical Society*

Michael A. Tighe Lowell, 9 Central Street

*Middlesex South District Medical Society*

David C Dow, Cambridge, 1587 Massachusetts Avenue

*Norfolk District Medical Society*

Walter A Lane Milton 173 School Street Vice-Chairman

*Norfolk South District Medical Society*

William G Curtis Wollaston, 10 Grand View Avenue

*Plymouth District Medical Society*

Thomas H McCarthy, Brockton 142 Main Street

*Suffolk District Medical Society*

Channing Frothingham, Boston Office Jamaica Plain 1153 Centre Street

*Worcester District Medical Society*

Ernest L Hunt Worcester 28 Pleasant Street

*Worcester North District Medical Society*

Harry R Nye Leominster 19 Lancaster Street

DELEGATES AND ALTERNATES TO HOUSE  
OF DELEGATES—AMERICAN MEDICAL  
ASSOCIATION

## DELEGATES

## ALTERNATES

June 1 1935 to June 1 1937

Richard H. Miller Bos	Cadis Phipps Brookline
Edmond F Cody New Bedford	Philemon E Truesdale Fall River
Reginaid Fitz Boston	George P Reynolds Boston

June 1 1936 to June 1 1938

Charles E Mongan Somerville	Arthur W Marsh Worcester
Michael A Tighe Lowell	Walter G Phippen Salem
Walter A Lane Milton	Paul P Henson Hyannis

## COUNCILORS—1936 1937

ELECTED BY THE DISTRICT MEDICAL SOCIETIES AT THEIR  
ANNUAL MEETINGS APRIL 15 TO MAY 15 1936

NOTE—The initials M N C following the name of a Councilor indicate that he is a member of the Nominating Committee V P indicates that a member is a Councilor by virtue of his office as President of a district society and so Vice President of the general society C indicates that he is chairman of a standing committee Sec that he is secretary of his District Society

## BARNSTABLE

M E Champion North Harwich V P  
S M Beale, Sandwich  
W D Kinney Osterville M N C  
J I B Vall, Hyannis, 155 Main St., Sec

## BERKSHIRE

W T Frawley, Pittsfield 184 North St., V P  
R J Carpenter, North Adams 85 Main St  
I S F Dodd Pittsfield 34 Fenn St.  
H J Downey, Pittsfield, 184 North St., Sec,  
M N C  
G P Hunt, Pittsfield, 34 Fenn St  
W P Kelly, Pittsfield 61 Union St  
T H Nelligan, Pittsfield, 184 North St.  
G H Thompson, Pittsfield 74 North St.

## BRISTOL NORTH

L E Butler, Taunton, 148 High St V P  
W H Allen, Mansfield 70 North Main St.,  
M N C  
A. R Crandell Taunton, 48 Church Green  
C B Kingsbury Taunton, 63 Prospect St., Sec.  
F V Murphy, Attleboro, 51 Bank St.

## BRISTOL SOUTH

J M Bonnar, New Bedford 90 Hillman St., V P  
J A Barré Fall River, 1555 Pleasant St.  
R H Baxter, Marion, 6 South St.  
G W Blood Fall River, 82 New Boston Rd  
R B Butler, Fall River, 278 North Main St.  
E F Cody, New Bedford, 105 South Sixth St.  
M N C  
E D Gardner New Bedford 150 Cottage St.  
S V Merritt Fall River 297 Osborn St  
Charles Shanks, New Bedford 645 Kempton St.,  
Sec  
I N Tilden Mattapoisett, Barstow St  
C C Tripp, New Bedford, 416 County St.  
P E Truesdale, Fall River, 151 Rock St

## ESSEX NORTH

C F Warren, Amesbury, 1 School St., V P  
E S Bagnall, Groveland, 281 Main St, Sec  
R. V Baketel, Methuen 7 Hampshire St  
C S Benson, Haverhill 30 Summer St.  
J F Burnham, Lawrence, 567 Haverhill St  
Z W Colson Lawrence, 301 Essex St  
H. F Dearborn, Lawrence 193 Garden St  
H R Kurth, Lawrence, 477 Essex St.  
L C Peirce Newburyport 279 High St.  
G L Richardson Haverhill 117 Emerson St.  
F W Snow, Newburyport, 24 Essex St.  
W D Walker Andover 121 Main St M N C

## ESSEX SOUTH

C A Bonner Hathorne, Danvers State Hospital V P  
N P Breed, Lynn, 9 Washington Square  
Hanford Carvell, Gloucester 1038 Washington St., M N C  
J G Corcoran Hamilton Main St.  
C L Curtis, Salem 101 Federal St.  
C F Deering Danvers 38 Elm St  
J F Donaldson Salem 32 Lynde St  
R E Foss, Peabody 125 Main St.  
J F Jordan Peabody 76 Lynn St  
B B Mansfield, Ipswich 4 Greene St  
A E Parkhurst Beverly 163 Cabot St  
O S Pettingill, Middleton, Essex County Sanatorium  
C H Phillips, Beverly, 11 Broadway  
W G Phippen Salem 31 Chestnut St  
R E Stone Beverly 88 Lothrop Boulevard, Sec  
J W Trask Lynn 90 Ocean St

## FRANKLIN

W J Pelletier, Turners Falls 171 Avenue A  
V P  
H M Kemp Greenfield 42 Franklin St M N C  
Charles Moline Sunderland Office South Deer  
field 120 Main St Sec

H G Stetson, Greenfield 39 Federal St, Ex Pres  
A H Wright, Northfield Main St

HAMPDEN

P E Gear Holyoke, 630 Dwight St, V P  
F H Allen Holyoke 16 Fairfield Ave  
T S Bacon, Springfield 69 Maple St  
E P Bagg Jr, Holyoke 207 Elm St  
J M Burnie, Springfield, 14 Chestnut St.  
Ex Pres  
J J Carrol Holyoke 192 Chestnut St  
L D Chapin Springfield, 20 Maple St  
W A R Chapin Springfield, 121 Chestnut St  
J L Chereskin Longmeadow Office Springfield  
333 Bridge St.  
A J Douglas Westfield 93 Elm St  
Frederic Hagler Springfield 20 Maple St  
G D Henderson Holyoke 312 Maple St  
E A Knowlton Holyoke 207 Elm St  
M W Pearson Ware 19 Pleasant St  
A G Rice Springfield 33 School St  
G L Schadt, Springfield 44 Chestnut St  
M N C  
H L Smith Springfield 249 Union St Sec  
G L Steele Springfield, 20 Maple St

HAMPSHIRE

Ward Young Northampton, 78 Main St V P  
A J Bonnevillie Hatfield 43 Main St.  
J G Hanson Northampton 219 Elm St M N C  
F E O'Brien Havdenville Hampshire County  
Sanatorium Sec

MIDDLESEX EAST

J H Kerrigan, Stoneham 481 Main St, V P  
J H Blaisdell Winchester Office Boston 45  
Bay State Rd  
Richard Dutton Wakefield 33 Avon St  
E M Halligan Reading 3 Salem St  
K. L. MacLachlan Melrose 1 Bellevue Ave Sec  
R R. Stratton Melrose 538 Lynn Fells Park  
way M N C  
F O West, Woburn 60 Pleasant St.

MIDDLESEX NORTH

F P Murphy Lowell, 175 Central St V P  
M L Alling Lowell 9 Central St  
D J Ellison Lowell 8 Merrimack St  
A. R Gardner Lowell 16 Shattuck St.  
G A Leahey Lowell 128 Merrimack St  
T A Stamas Lowell 226 Central St. Sec  
E O Tabor, Lowell 16 Shattuck St M N C  
M A Tighe Lowell 9 Central St

MIDDLESEX SOUTH

S H Remick Waltham 775 Trapelo Rd, V P  
C F Atwood Arlington 821 Massachusetts Ave  
E W Barron Malden Office Boston 20 Ash St  
C E Barstow Arlington 754 Massachusetts  
Ave  
C F K Bean West Medford, 51 Harvard Ave  
E H Bigelow Framingham Center 31 Pleasant  
St. Ex Pres  
G F H Bowers Newton Highlands 156 Wood  
ward St.  
C O Chase Watertown 6 Patten St  
F R. Clark Newtonville 221 Walnut St  
B F Conley Malden 51 Main St.  
A C Cummings Newton 447 Center St  
D F Cummings Natick, 12 East Central St  
H F Day Cambridge Office Boston 412 Beacon  
St  
J E Dodd Framingham 141 Franklin St  
D C Dow Cambridge 1587 Massachusetts Ave  
A W Dudley Cambridge 1740 Massachusetts  
Ave M N C  
H Q Gailupe Waltham 751 Main St

W G Grandison Charlestown, 65 High St.  
F A Higginbotham Watertown 112 Mt. Auburn  
St  
N M Hunter Hudson 20 Lincoln St  
C M Hutchinson Cambridge, 47 Garden St.  
A M Jackson Everett 512 Broadway  
A. A Levi Cambridge Office Boston 485 Com  
monwealth Ave Sec.  
F P Lowry Newton 313 Washington St.  
F L MacDonald Waltham Office Boston 220  
Marlborough St  
R A McCarty Waltham 876A Main St  
L W McGuire Malden Office Boston, 375 Com  
monwealth Ave  
J A. McLean West Somerville 16 Curtis St  
Edward Mellus Newton 15 Clements Rd  
C E Mongan Somerville 24 Central St Pres  
F L Morse Somerville 78 Highland Ave  
J P Nelligan Cambridge 2336 Massachusetts  
Ave  
E J O'Brien Jr Brighton, Office Boston 270  
Commonwealth Ave  
Dwight O'Hara Waltham Office Boston 5 Bay  
State Rd  
C T Porter Waltham Office Boston, 520 Com  
monwealth Ave  
W D Reid Newton Office Boston 510 Com  
monwealth Ave  
T E Reilly Marlborough 6 Newton St  
E S A Robinson Newton Center Office  
Jamaica Plain 375 South St  
E. J Sawyer Newton 488 Center St  
M J Schlesinger Brighton, 22 Commonwealth  
Terrace  
E F Sewall Somerville 380 Broadway  
D W Sherwood Newtonville Office Boston 66  
Commonwealth Ave  
F G Smith Somerville 145 Highland Ave  
H. P. Stevens Cambridge 1911 Massachusetts  
Ave  
H W Thayer Newtonville 355 Walnut St.  
Fresenius Van Nuis Weston Boston Post Rd  
R. H Wells Lexington 1430 Massachusetts Ave  
M W White Somerville 21 Walnut St  
R K Whiton Concord 7 Sudbury Rd  
W S Whittemore Cambridge 3 Concord Ave  
Alfred Worcester Waltham 314 Bacon St.  
Ex Pres

NORFOLK

Maurice Gerstein Roxbury Office Boston 483  
Beacon St V P  
K R Bailey Jamaica Plain Office Boston 483  
Beacon St  
F G Balch, Jamaica Plain Office Boston 279  
Cisrendon St. C  
J R. Barry West Roxbury 1857 Center St  
H G Batchelder Dedham Office Boston 510  
Commonwealth Ave  
A S Begg, West Roxbury Office Boston 80  
East Concord St. Sec  
D D Berlin Brookline Office Boston, 68 Bay  
State Rd  
M G Berlin Brookline Office Boston 68 Bay  
State Rd  
D N Blakely Brookline Office Boston 87 Milk  
St C  
H K Boutwell Brookline 15 Green St  
F S Cruickshank Brookline 1247 Beacon St  
Sec  
S F Curran \* Dorchester 104 Norfolk St  
R. A Draper Dorchester 1107 Washington St  
D G Eldridge Dorchester 15 Monadnock St  
H M Emmons West Roxbury Office Boston  
354 Commonwealth Ave

C B Faunce, Jr, Jamaica Plain Office Boston,  
390 Commonwealth Ave  
I A Finkelstein, Dorchester, 1095 Blue Hill Ave  
J F Ford, Roslindale 8 Walter St  
C S Francis, Brookline, 76 High St  
Morris Frank, Roxbury, 173 Humboldt Ave  
L M Freedman, Brookline, Office Boston, 475  
Commonwealth Ave  
W A Griffin, Sharon, 28 South Main St., M N C  
J B Hall, Roxbury, 60 Windsor St  
L F Johnson, Norwood, Office Boston, 15 Bay  
State Rd  
G W Kaan, Sharon G P O  
W B Keeler, Roxbury, Office Boston, City Hall  
Annex.  
C J Kickham, Brookline, 31 Harvard St  
H M Landesman, Roxbury, Office Boston, 463  
Commonwealth Ave  
W A Lane, Milton, 173 School St  
J S H Leard, West Roxbury, 1895 Center St  
F P McCarthy, Milton, Office Boston, 371 Com  
monwealth Ave  
E F Murphy, Jamaica Plain, Office Roxbury,  
394 Riverway  
Samuel Nadel Dorchester 14 Gallivan Boulevard  
H C Petterson, West Roxbury, Office Boston,  
15 Bay State Rd  
Cadis Phipps, Brookline, Office Boston, 587 Bea  
con St  
Frederick Rels, Dorchester, 407 Washington St  
A. T Ronan, Dorchester, Office Boston, 270 Com  
monwealth Ave  
E P Ruggles, Dorchester, Office Boston, 510  
Commonwealth Ave  
M V Safford, Jamaica Plain 15 Grovenor Rd  
D D Scannell, Jamaica Plain, Office Boston, 475  
Commonwealth Ave  
J A Seth, Milton, Office Boston, 47 Bay State  
Rd  
Max Sturnick, Dorchester, 12 Columbla Rd  
J W Tiede Dedham, Office Boston, 520 Com  
monwealth Ave  
H F R Watts, Dorchester, 6 Monadnock St.  
G W Winchester, Milton, 128 Blue Hills Park  
way

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C S Adams, Wollaston, 62 Brook St  
R L Cook, Quincy, 38 Russell Park Sec  
W G Curtis Wollaston, 10 Grand View Ave  
F L Doucett, East Weymouth, 667 Broadway  
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V P  
L A Alley, Lakeville, Lakeville State Sana  
torium  
W T Hanson Bridgewater State Farm M N C  
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P H Leavitt, Brockton, 129 West Elm St.  
A M Lemay, Brockton 7 Main St  
T H McCarthy, Brockton 142 Main St  
J J McNamara, Brockton 231 Main St.  
A C Smith Brockton, 142 Main St.  
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pital, C  
H A Christian Boston, Peter Bent Brigham  
Hospital  
H M Clute, Chestnut Hill, Office Boston, 171  
Bay State Rd  
Lincoln Davis, Boston, 279 Beacon St.  
R L DeNormandie, Boston, 355 Marlborough  
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G B Fenwick, Chelsea, 38 Cary Ave  
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M N C  
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pital  
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F H Lahey, Boston 605 Commonwealth Ave  
T H Lanman, Roxbury, 300 Longwood Ave  
R. I Lee, Boston, 264 Beacon St., C  
C C Lund, Boston 319 Longwood Ave, Sec  
L S McKittrick, Boston, 205 Beacon St.  
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House Room 546  
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G P Reynolds Boston, 311 Beacon St  
W H Robey, Boston, 202 Commonwealth Ave.,  
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I J Walker, Boston, 520 Commonwealth Ave  
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David Harrower, Worcester 13 Elm St., M N C  
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E R Leih, Worcester, 36 Pleasant St  
W F Lynch Worcester, 390 Main St  
A. W Marsh, Worcester, 690 Main St.

\*Deceased

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ELECTED BY THE DISTRICT MEDICAL SOCIETIES AT THEIR  
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1936

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## FUNDAMENTALS IN THE CANCER PROBLEM\*

BY GRANTLEY W. TAYLOR, M.D.

It is obvious to every student of the cancer problem that we do not avail ourselves fully of our resources in combating the disease, and that the major defects of our current practice are delay and improper treatment. A large responsibility for these defects must be attributed to the general practitioners, both in relation to their management of individual patients and in relation to their educational function toward the population in general.

In cases with symptoms of early cancer delays on the part of the patient in failure to report promptly to the physician due to ignorance, fear, or carelessness must be reduced by a broad public educational program in which the local practitioner must play a major part. Delays and improper treatment after the patient has come under the care of his physician are in a large measure avoidable and become progressively less pardonable as our resources for diagnosis and proper treatment are increased and made more readily available throughout the state.

In the course of observation of patients coming to cancer clinics we have been interested in analyzing the factors contributing to initial improper management of the cancer patient. These factors, while manifested in myriad forms, may be grouped into three general categories: errors in diagnosis, errors in estimate of the extent of the disease, and errors in treatment. In the hope of avoiding such errors, it seems desirable to formulate certain simple questions for the practitioner to answer. In a conscientious attempt to answer the questions, the physician may be able to avoid the errors and delays with which he might otherwise be charged.

### 1. What is the disease?

It is hardly necessary to stress the importance of diagnosis, and yet the clinics and hospitals bear witness with hundreds of cases that patients have been treated often for months before a correct diagnosis was established. Often the error is due to the physician's carelessness or to an incomplete examination of the patient. Large numbers of patients with carcinoma of the rectum have undergone treatment for hemorrhoids without ever having had a digital rectal examination. Patients with uterine cancers will have used prescribed tonics and douches often for months before a vaginal examination has been carried out. Powders prescribed for indigestion almost routinely pre-

ceded gastro-intestinal x-ray examination in patients with carcinoma of the stomach. Even when the lesion is obvious, the nature of it is not even suspected by the physician who treats carcinoma of the skin with ointments, or carcinoma of the tongue with a caustic pencil.

Sometimes the failure to establish early diagnosis may be due to lack of local facilities. Cystoscopic examinations, certain x-ray procedures, frozen section, pathologic facilities, blood chemistry studies—these and many others may not be available in many communities. Often the resources of a fully equipped hospital are unable to establish beyond doubt the presence or absence of carcinoma. Instances of this sort emphasize the fact that it would be too much to expect of the physician that he should establish the positive diagnosis unaided. However, he should be responsible for suspecting the diagnosis of cancer and he should carry through with the study if necessary with the help of consultants or a cancer clinic until a definite diagnosis has been reached.

Perhaps we should revise our first question to read "Can this patient have a cancer?" I venture to suggest that if each physician should ask himself this question every time he sees a new patient or even an old patient, a great many carcinomas would be brought to light considerably earlier than they would have been otherwise. A valuable by-product of such an inquiry diligently pursued would be the establishment of accurate diagnosis of a great many benign conditions, laying the basis in most cases for the institution of rational therapy. Indeed, at places like the Pondville Hospital, we effectively make use of a modification of this question by asking ourselves "Are we certain that this patient has a cancer?" The result of such a question has been the discovery and salvage of a considerable number of benign, remediable conditions masquerading under the guise of incurable malignant disease.

### 2. Is the cancer in a curable stage?

Assuming that we have established a correct diagnosis of carcinoma, it is essential to any program of rational treatment that the extent of the disease be properly appraised. Careful search should be made for metastatic disease in the regional lymph nodes, liver, lungs, and skeleton before a case should be submitted to radical operation. We see too many cases who have undergone extensive mutilating painful and expensive operations, let us say for carcinoma of the breast, when preoperative study would have revealed the presence of remote

\*Read at the Annual Meeting of the Essex North District Medical Society at Salem on May 6, 1936.

†Taylor, Grantley W.—Assistant Surgeon, Massachusetts General Hospital. For record and address of author see "This Week's Literature."

metastatic disease which would have made the operation useless. Such operations are not only unnecessary, but do much in a community to contribute to the feeling among the laymen that carcinoma is invariably fatal, and that surgery for the condition is useless. Radical treatment should be made to be successful as often as possible, and in this way it may help to eradicate the general attitude of despair.

On the other hand, many surgeons are only too willing to class a condition as inoperable, and by temporizing or palliating, valuable time is often lost to the patient.

These aspects of the cancer problem touch the general practitioner closely. All too often he is himself seized with the general attitude of despair. He withholds from his patient with carcinoma of the stomach the possible benefit of exploration, he submits his patient with advanced breast carcinoma to operation, and then shares with the family the disappointment of recurrence within a few months, he acquiesces in a palliative colostomy because his local surgical consultant has had no experience in the radical operation for rectal carcinoma.

Again here, perhaps, it is too much to ask of the family physician that he should be qualified to determine the exact extent of the disease, and its curability. Again he is justly open to reproach if he fails to avail himself of the best advice he can secure in the individual case. His task is to interpret the consultant's advice to the patient and his family, to explain the necessity for preoperative studies to rule out metastatic disease, and to persuade the reluctant patient to undergo an operation which offers a prospect of cure.

### 3 What is the proper standard treatment?

The answer to this question obviously depends on an accurate answer to the second question, and so must be divided into two parts.

#### (a) The disease is curable

Proper standard methods of treating various types of malignant disease have been fairly well established for many years. Controversies and debates may arise in regard to various types of carcinoma, but in general the principles remain constant. The periodical literature tends primarily to include discussions of these controversial points and hence much of what is written tends only to confuse the practitioner. The publications of tentative and experimental methods of treatment by research institutions not only present alternative procedures to the general surgeon, but also stimulate a desire to conduct individual experiments in the field of cancer therapy. It need hardly be pointed out that such experimentation should be almost entirely restricted to institutions which possess complete facilities for thorough studies, as well as a sufficient body of experience in standard

procedures to offer an accurate control series. Many communities throughout the country have private cancer specialists, who have developed so-called therapeutic procedures quite at variance with standard practice, and who by virtue of publicity attract and mismanage large numbers of cancer patients. In the field of cancer especially, where careful end result studies are necessary to permit appraisal of treatment, such heterodox methods are particularly likely to develop, and particularly difficult to curb.

But while many patients are lost by wilful disregard of usual methods of treatment, probably even more suffer from ignorance of these methods on the part of the general surgeon. Simple mastectomy for carcinoma still seems to be entirely adequate treatment to many surgeons. At the Pondville Hospital, we have a considerable number of patients with carcinoma of the cervix or uterine fundus who have been treated by supravaginal hysterectomy, even after the diagnosis had been accurately established by pathologic examination. Disregard of possible regional lymph node involvement is common among dermatologists and radiologists who undertake to treat carcinoma of the skin, lip, or buccal mucosa. Excessive conservation in excision of skin lesions, to avoid disfigurement, courts the disaster of early recurrence. Inadequate doses of radiation often cause temporary disappearance of obvious lesions, and lead to a premature cessation of treatment.

It is too much to expect the practitioner to be familiar with the procedures that constitute adequate standard treatment of carcinoma, although such familiarity is obligatory for the general surgeon who undertakes the treatment of cancer. The practitioner should know what men or institutions in his community are competent to carry out the proper treatment, and should see to it that his patients receive such treatment. Surgeons or radiologists without knowledge or experience in the proper procedures or improperly equipped for carrying them out, should not undertake treatment of cancer. The first attempt at cure is the most likely to succeed, and we are under obligation to our patients to see that the attempt is properly made.

#### (b) The disease is incurable

When our preliminary study has established the fact that the disease is incurable, or when because of poor general condition a radical operation is too formidable a procedure, the problem becomes one of palliation. We must at once decide what can be done to improve the patient's comfort during his remaining life. If the problem is viewed squarely in this way, much of what is now regarded as palliation



must be given up Prolongation of life must not be sought unless at the same time the patient can be relieved of distressing symptoms In general, incurable carcinoma cases are treated too vigorously, without bearing in mind that the objective is the relief of symptoms Massive doses of radiation with their attendant distress should not be employed when smaller doses are just as effective

Neurosurgical procedures, although they may appear to be radical in some instances relieve pain more efficiently and with less distressing accessory effects than do large doses of morphine Cleansing of wounds, irrigations removal of sloughing masses of tumor, all conduce to the comfort of the patient and are too often neglected The usefulness of palliative operations such as tracheotomy, gastrostomy, cystotomy, or colostomy, should be appraised in regard to each individual patient These operations should be undertaken not primarily to prolong life but for the relief of specific symptoms In some instances indeed, radical operations are justified simply as palliative procedures—such as amputation of a limb with fungating sarcoma, even in the presence of lung metastases or radical removal of the rectum in the presence of liver metastases

Problems of palliation and of the care of the incurable cancer patient again come directly under the management of the family practitioner If he will pause long enough to ask

himself what the function of palliation is and how it can best be achieved, he can do much to relieve and comfort his patient

In conclusion, the cancer problem involves research into the cause of the disease and into more effective methods of treatment The general practitioner should not attempt to enter this field The problem involves education of the general public in recognition of early symptoms and in acceptance of regular and thorough examinations In this education the practitioner should play a prominent part The problem involves education of the general surgeon and radiologist in the proper standard procedures of diagnosis and treatment of cancer and in knowledge of the prognosis of various stages of the disease In this field the family physician can contribute not a little by insistence upon competence in his consultants Finally the cancer problem involves the education of the general practitioner in suspecting or recognizing malignancy, and in knowing where to refer his problems for further diagnosis or treatment He may be aided in his self-education in this field, by asking himself a few simple questions

- 1 Is this cancer?
- 2 Is it curable?
- 3 If so, what is the treatment and who is qualified to carry it out?
- 4 If incurable, what is the purpose of palliation?

## MASSACHUSETTS MEDICO-LEGAL SOCIETY

### THE NEEDS FOR IMPROVEMENT IN MEDICOLEGAL INVESTIGATIONS\*

BY THOMAS A GONZALES M.D.†

THE purpose of this presentation is to review certain fundamental principles which are vitally necessary for the proper conduct of an investigative medicolegal organization to suggest certain changes which would react to the benefit of such an organization and to discuss the advantages of educational and financial relationships for the future development of legal medicine Any expected improvement in the methods of medicolegal investigation depends largely upon these principles, changes and relationships and on the educational efforts of those who are engaged in teaching the specialty

That there is need for improvement cannot be denied This is especially noteworthy in the small communities and rural districts where the lack of laboratory facilities and other nec-

essary aids increases the difficulties of the investigator to the extent that it is impossible to do good work The situation is somewhat relieved in the medium-sized and large cities Laboratory advantages are usually available and where there is no objection to their use many of the ordinary procedures in histopathology and bacteriology may be carried out The average hospital laboratory is generally equipped for this work if not for the more technical procedures In a locality where there is a university with a medical department, conditions may be ideal provided the university is willing to co-operate If it so happens that the institution is state controlled, matters are simplified to a considerable extent Unfortunately our form of government and system of medicolegal procedure cannot be so readily adapted to university affiliations as in the foreign countries where these institutions are state controlled and are intimately related to the medicolegal sys-

Read at a meeting of the Massachusetts Medico Legal Society at Springfield Mass June 9 1937  
†Gonzales Thomas A—Acting Chief Medical Examiner New York City For record and address of author see This Week's Issue page 405

metastatic disease which would have made the operation useless. Such operations are not only unnecessary, but do much in a community to contribute to the feeling among the laymen that carcinoma is invariably fatal, and that surgery for the condition is useless. Radical treatment should be made to be successful as often as possible, and in this way it may help to eradicate the general attitude of despair.

On the other hand, many surgeons are only too willing to class a condition as inoperable, and by temporizing or palliating, valuable time is often lost to the patient.

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Proper standard methods of treating various types of malignant disease have been fairly well established for many years. Controversies and debates may arise in regard to various types of carcinoma, but in general the principles remain constant. The periodical literature tends primarily to include discussions of these controversial points and hence much of what is written tends only to confuse the practitioner. The publications of tentative and experimental methods of treatment by research institutions not only present alternative procedures to the general surgeon, but also stimulate a desire to conduct individual experiments in the field of cancer therapy. It need hardly be pointed out that such experimentation should be almost entirely restricted to institutions which possess complete facilities for thorough studies, as well as a sufficient body of experience in standard

procedures to offer an accurate control series. Many communities throughout the country have private cancer specialists, who have developed so-called therapeutic procedures quite at variance with standard practice, and who by virtue of publicity attract and mismanage large numbers of cancer patients. In the field of cancer especially, where careful end result studies are necessary to permit appraisal of treatment, such heterodox methods are particularly likely to develop, and particularly difficult to curb.

But while many patients are lost by wilful disregard of usual methods of treatment, probably even more suffer from ignorance of these methods on the part of the general surgeon. Simple mastectomy for carcinoma still seems to be entirely adequate treatment to many surgeons. At the Pondville Hospital, we have a considerable number of patients with carcinoma of the cervix or uterine fundus who have been treated by supravaginal hysterectomy, even after the diagnosis had been accurately established by pathologic examination. Disregard of possible regional lymph node involvement is common among dermatologists and radiologists who undertake to treat carcinoma of the skin, lip, or buccal mucosa. Excessive conservation in excision of skin lesions, to avoid disfigurement, courts the disaster of early recurrence. Inadequate doses of radiation often cause temporary disappearance of obvious lesions, and lead to a premature cessation of treatment.

It is too much to expect the practitioner to be familiar with the procedures that constitute adequate standard treatment of carcinoma, although such familiarity is obligatory for the general surgeon who undertakes the treatment of cancer. The practitioner should know what men or institutions in his community are competent to carry out the proper treatment, and should see to it that his patients receive such treatment. Surgeons or radiologists without knowledge or experience in the proper procedures, or improperly equipped for carrying them out, should not undertake treatment of cancer. The first attempt at cure is the most likely to succeed, and we are under obligation to our patients to see that the attempt is properly made.

#### (b) The disease is incurable

When our preliminary study has established the fact that the disease is incurable, or when because of poor general condition a radical operation is too formidable a procedure, the problem becomes one of palliation. We must at once decide what can be done to improve the patient's comfort during his remaining life. If the problem is viewed squarely in this way, much of what is now regarded as palliation

haps this could be an accomplished fact if one could find this fortunate blend of medical erudition and judicial acumen in the one individual

#### EDUCATION

There has been and still is little opportunity for those who wish to perfect themselves in the specialty. It is true that several universities have added courses to their curricula but it cannot be truthfully said that they are well organized. The fact that the statutes in some places discourage the use of material having legal significance for other than court purposes and the prohibition by prosecuting agencies from revealing the details of medical investigations in criminal cases leave little available material for the teaching of pure criminal medicine. Nevertheless a considerable amount of material remains which can be used for example cases where civil litigation or compensation questions may arise the many deaths from natural causes and the use of museum specimens in the criminal cases.

The question whether instruction should be limited to graduates in medicine or include undergraduates has not been definitely settled. It may be admitted that graduate teaching is more satisfactory especially if the student has had training in general pathology. In fact this should be a requirement if results commensurate with the effort are expected.

For postgraduate instruction a course could be easily arranged in the localities where the system of medical examiners exists. This could include practical training at the necropsy table, lectures, demonstrations and conferences. In this way the training of experts in legal medicine for service in all parts of the country could be accomplished and the general development of the science through practical application research and investigation made possible.

The undergraduate should not be denied the opportunity for instruction in the fundamentals, but no good purpose is served by the attempt to offer an intensive course in the subject. There can be no question that before the specialty of legal medicine is seriously considered as a career one should be adequately trained in general pathology. It is neither wise nor desirable to attempt a career under other circumstances. While the well-trained pathologist may after the proper training and practical instruction acquire a comprehensive knowledge of medicolegal practice, he can in no wise be considered an expert until he has gained the necessary experience by practical application.

The discussion of these educational activities brings up the question of the forensic institute. In this country there is as yet nothing remotely comparable to the first-class institutes of Europe and while the methods of scientific medi-

cine which form the basis of foreign medicolegal systems are as well developed here as they are abroad no attempt has been made to coordinate them. This could be easily accomplished in an institute of legal medicine with its compact arrangement of laboratories and the correlation of these agencies with the necropsy work.

If these institutes are to be erected in this country they should be built with the governmental functions of the medical examiner in mind and with a view to improving his service to the public. The educational facilities can be readily built around the office but should occupy a secondary place to its special duties. Under no circumstances should an institute be erected at the expense of the normal conduct of the medical examiner's investigative functions.

The building of an institute would entail considerable financial outlay and could perhaps be accomplished only in the more populous localities. Nevertheless their influence on the development of legal medicine in the surrounding communities would be noteworthy in addition to the valuable adjuncts in the institute for research, education and the practical applications of the specialty.

Adequate financial support of any medicolegal system is largely a matter of education of public officials responsible for the budget and education of the public which is responsible for the public officials. The failure of both to appreciate the importance of the public duties performed and the consequent inadequate financial support often make it impossible to acquire the necessary aids for the proper conduct of the office. This is generally true whether the community maintains a coroner or medical examiner system.

In recent years there has been encouraging support from the medical profession. In some localities organized medicine has become interested to the extent of formulating plans for the future and has strongly supported suggested changes which would if adopted result in appreciable improvement. Through this support and through the educational activities of those interested in the development of legal medicine there is hope for the future.

To summarize where the coroner system exists it should be supplanted by the modern medical examiner system. The present medical examiners should receive adequate financial support and where abundant material is available the facilities to organize an educational system for the training of experts. Courses should be arranged with a view to attracting those who desire instruction at a reasonable fee. This could be easily accomplished in the cities of Boston, Newark, New York and perhaps other cities where both laboratory advantages and abundant material are available.

tems. In this country the privately owned university's educational interests and the purely governmental functions of our medicolegal systems are not easily combined because much of the material has legal significance and cannot be made available for teaching purposes.

In relation to the technical procedures which are difficult or impossible in the ordinary hospital laboratory, all of these are desirable adjuncts and some are indispensable. Few hospital laboratories are equipped for toxicology or for the types of chemistry required in medicolegal investigations. The reason for this is that these sciences play a small part in hospital practice except in the large urban centers and as a result there is little opportunity for practical training in them. The value of these procedures is not limited to the detection of poisons in human organs; they may be profitably utilized as a routine measure for the detection of alcohol in homicides, highway accidents and many other casualties, for the isolation of industrial poisons and for the examination of many objects connected with crime when for one reason or another a chemical investigation may be necessary. For these reasons alone, toxicology and chemistry may be considered essential in medicolegal practice.

The same is true of serology. Most of the ordinary immunologic procedures used in the average hospital laboratory are of limited value in legal medicine. For instance, precipitin tests for human blood are rarely requested and the usual blood group determinations for the purpose of transfusion are not ordinarily sufficient. Not infrequently it is necessary to examine for the subgroups and to perform the delicate absorption tests. For the purposes of these investigations adequate experience is desirable if satisfactory results are expected. Other tests which may prove useful on occasions are the Wassermann or one of its modifications and the Aschheim-Zondek test for pregnancy in certain cases of criminal abortion when the customary histopathological methods fail. Both are of limited value. The former requires non-hemolyzed and nonanticomplementary blood and the latter is useless after three or four days postpartum.

While the blood group determinations at the present time are only of limited value this type of serology may assume increased importance as our knowledge advances. Recently we have established a routine determination of the blood group of every homicide.

The results are recorded in the event that a stain on a weapon recovered later may be compared with the deceased's blood. Depending upon the circumstances a negative or positive result may have its value. Caution must be exercised in the examination of old and de-

composed blood stains where the results are usually unsatisfactory or may be misleading.

There are many other laboratory methods which may prove useful. Among these may be mentioned the various investigations for the presence of human secretions and excretions, the examination of hair, metals, woods and textiles and the detection of radioactive substances. For the latter, equipment for physical processes and physical chemistry is essential.

In stressing these laboratory needs there is no intent to emphasize them but to indicate that no medicolegal system can function efficiently without them. It is not infrequent that after a most careful necropsy the cause of death is not definitely established and further investigation is necessary. For this purpose the laboratories are essential. In a large service about 20 per cent of all cases fall in this category and it has been our experience that about 2 per cent of the total cases remain unsolved despite these investigations. They must of necessity be recorded as unknown causes of death for there is no place for post facto diagnoses in legal medicine. Another difficulty is the impossibility of obtaining satisfactory histories in some cases and the investigator must rely on his powers of observation and the laboratory aids to establish a diagnosis.

As far as general laboratory service is concerned, it is most desirable that the assistants be completely under the control of the investigator. Furthermore their work should be highly efficient in order that the results may be relied upon. Where financial or other considerations prevent the use of these facilities, it is better to use available hospital laboratories than none at all.

In connection with the suggested changes, if the practical applications of medicolegal investigations are to be elevated to a high plane, it can readily be brought about in those localities where the medical examiner's system exists. I might go farther and state that if there is to be an appreciable improvement in legal medicine in this country, it can be accomplished by the substitution of the medical examiner for the coroner. There can be no question that the more modern system has conclusively proved its worth where a real change has been made. We accomplish nothing by retaining the basic principles of the coroner and merely changing the name to medical examiner. The fundamental difference between the two systems namely, the separation of the purely medical from the judicial functions and in some localities the disavowment from political control are the important steps in advance. Referring to the coroner Dr. Oscar T. Schultz says "The duties are medical and magisterial each kind of duty requires specialized technical knowledge if the work of the office is to be well done." Per-

lation should be enlarged in this "automobile" age to produce better efficiency

Regarding education, since no postgraduate course or other means of increasing his efficiency is available a good course in forensic medicine would be welcomed book information rarely covers cases

My medicolegal associates seem to be in one of two classes either they know it all or nothing In most cases the more they know the less they seem to know and the more cautious they are

District attorneys generally are interested in your work only as you prepare cases for successful prosecution and in your ability on the witness stand

They are not interested in your efforts to ascertain causes of death except in criminal cases which are comparatively few So without their authority as is the general practice investigation by autopsy is almost nil in districts outside of Suffolk County

Another handicap is that outside of Suffolk County where salaries obtain our fee system through economy of the County Commissioners, again balks our efforts

My suggestion is that all medical examiners be placed on salaries proportionate to the size of the district, its population and the number of cases the district has produced in the past

This would remove to a great extent the present ban on the thorough investigation of the cause of a death in most of our cases and our certification would be a record of fact and not, as often happens an official guess

When you consider that in many of our hospitals nearly 50 per cent of deaths are autopsied where criminal violence is not even an issue you can readily appreciate how far we are in the Dark Ages with our hands bound doing 2 or 3 per cent except in Suffolk County

DR. GONZALES Our law states that if a person dies by criminal violence casualty or suicide suddenly at his occupation or in apparent health or in an unusual or peculiar manner or in prison the police shall notify the chief medical examiner and the medical examiner investigates the circumstances and if in his opinion an autopsy is necessary it is performed by one of the medical examiners

To illustrate the importance of this power I will cite cases

CASE 1 A man was riding on a horse after attending a hunt and fell He was certified as a case of coronary sclerosis and thrombosis because the coroner in this community had no power to order an autopsy The accident insurance company which was honest wished an autopsy The body was examined no coronary thrombosis was found but his neck was found broken and there were marked hemorrhages in the spinal cord and at the base of the brain No one is more competent to judge than the medical examiner whether an autopsy should or should not be done

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ed for tuberculosis No one claimed the body A hyoid bone fracture was found and the trilled roommate confessed that he had throttled him.

DA HUNT I am glad Drs Jones and Dow spoke of some good points in our system that it works so well is largely due to the wisdom and good sense of the district attorneys and medical examiners rather than the inherent excellence of the law We do fairly well under the circumstances In this state there is a growing tendency to government by commissions There has come to be an unreasonable and costly overlapping of investigations Thus in certain deaths occurring in State Hospitals the medical examiner is called but his findings are reviewed by the pathologist from the Department of Mental Diseases In cases of industrial accidents where death ensues there is still more overlapping of investigators If an employee happens to be electrocuted there may follow investigations by the Public Works Department, the Police Department the local authorities covering electrical installations and the Industrial Accident Board. The medical examiner's findings should be final in such cases and the Commonwealth spared the expense of investigations by other agencies of government The medical examiners have the authority to employ experts when needed and a comprehensive study of the causes of an accidental death would be possible under his direction Naturally he would not overstep normal duties of the police

DA OVERHOLSER I am glad to speak for the institutions for mental diseases Our interest is in the cause of death and whether it might have been due to negligence of an employee whether it had anything to do with the care of patients, or it was the repetition of something which might be prevented no criticism of medical examiners is intended I am sure our Secretary, Dr Canavan who is our Department Pathologist never had the idea of criticizing the medical examiners

Concerning the Forensic Institute, would it only deal with fatalities? It is important and crucial that expert witnesses for courts and state tribunals be available for psychiatric practice

I think of the function of a Forensic Institute as not strictly medical but as including chemical ballistic photographic and other facilities of value to the State in prosecuting criminal cases

DR. GAY Dr Frankish of Toronto has a laboratory such as Dr Overholser speaks of for final evidence

DR. GONZALES The Institute would not be limited to lethal cases We have a psychiatric section under consideration and Dr Israel Strass is considering its organization My idea is that our records should be open to the public other attorneys and so forth but the law prohibits news of criminal deaths At present Bellevue supplies the psychiatric angles but we would be prepared to take finger prints study ballistics and provide the services of the medical examiner and experts in psychiatry but I insist that the medical examiner should not be interfered with or subservient to a Foundation but responsible to the Mayor only

DR. BOOS The three cases about which Dr Gonzales has told us show how important it is to autopsy every case of sudden and unusual death. In most cases the autopsy findings are sufficient to account for the death in others a chemical examination may also be necessary In a third class of cases the autopsy findings suggest an adequate cause for death by mechanical violence but a chemical examination made for some reason or other reveals murder or attempted murder by poison

With the present transportation facilities there are no reasons why the smaller states such as Delaware, Rhode Island and perhaps New Jersey could not maintain a state medical examiner system. The larger states could be divided into districts comprising several counties depending upon the population. Each section could have a medical examiner and assistants administering to its needs and central laboratories could be provided. If for financial or other reasons the laboratories could not be established, hospital laboratories might be used.

Perhaps the consummation of these changes would be difficult when it is considered that the coroner is a constitutional office, an old established system in a country where changes in the existing laws are accomplished with difficulty. Nevertheless if we are to achieve any appreciable improvement in our methods of investigation, some changes are essential. If the abolition of the coroner is not feasible there should be some revision of the office in order that its duties may conform to the requirements of present-day scientific medicine. Regardless of system every scientific aid of proved value should be utilized. New methods of investigation should be developed by research in purely medical and allied sciences.

These needs are indispensable for the future development of forensic medicine, for crime detection and incidentally for the impartial administration of justice.

#### DISCUSSION

DR GAY We are very fortunate in having Dr Gonzales speak to us on the needs for extending the medicolegal service and the methods for providing for those needs. Once we had an attorney general who was unable to answer our questions on his paper, now we have someone who can. Dr Magrath, will you lead the discussion?

DR MAGRATH It is a treat to hear these most important matters spoken of as to the past and future.

The burden is on the medical schools to furnish means for teaching fundamentals and it must be met. How can we supply the required technical skill, especially in remote portions of large states? How is it handled in New York?

DR GONZALES In the state at large there has been no progress, in Westchester and Erie Counties they changed the name from coroner to medical examiner but the system was not changed.

The medical examiner is purely investigative not judicial. Our cases go to a magistrate and then we testify at the Grand Jury, if the case comes to trial we testify again as to the cause of death and the surroundings as we find them.

MRS LEE Suppose students come to study legal medicine are there positions awaiting them when they complete their instruction?

DR GONZALES No actual positions await them but there are plenty of jobs now held by incompetent men and there is a need for well trained men to go out and supplant the gynecologists the nose

and throat men and the foot doctors who have been appointed. One college offers thirty lectures a year in a two year course and after a satisfactory thesis a Doctor of Forensic Medicine degree is offered.

DR MAGRATH In other words, medical schools must create the demand for trained men as Public Health has done.

DR F D JONES How are you able to actually keep your work out of politics?

DR GONZALES What I mean is, the politicians do not interfere with our work. If X, Y or Z calls up and says, 'There should not be an autopsy on this man' we say, 'We are very sorry but it must be done' and it is done. Of course, if an old fellow breaks his hip in a fall at home and dies of pneumonia and someone objects we can say 'Why, all right,' and certify. But we are all civil service appointees from top to bottom and they can't displace us unless for due cause. The Mayor himself could not appoint a man Chief Medical Examiner unless he had passed the civil service examination and if we have an idea an autopsy should be done on a given case it is done and there is no one to 'ask'. The New York City law specifically states that if in the opinion of a medical examiner an autopsy is necessary, it shall be performed by a medical examiner. In other words, the opinion of whether an autopsy shall be performed devolves upon the medical examiner alone.

DR BRICKLEY It seems to me there are openings for well trained men in insurance. The insurance companies ask us from what a person died and a death claim values the individual in a range from \$4500 to \$10000. It would be very fine if the medical directors of insurance companies had the medical examiner's point of view. We do autopsies for the determination of causes of death. District attorneys do not bother us in Suffolk County, but in others the medical examiner is at the mercy of the whims of the district attorneys.

DR DOW I feel I must come to the defense of the district attorney. I have only had one who wished to dictate. The law says we must get permission for a postmortem examination from the district attorney the mayor or the selectmen. My district attorney said he trusted me and wanted to know the cause of death. Education on this point should spread through the Massachusetts Medico Legal Society.

DR F E JONES The qualifications of a medical examiner in this State are that they shall be 'able and discreet men, learned in the science of medicine'. They are appointed by the Governor.

I was appointed an associate medical examiner on the recommendation of the then medical examiner of the district because of his personal regard for me. Certainly I had no other professional qualifications except that I was a recent graduate of the Harvard Medical School where I had attended the required course in Legal Medicine and had done some special work under Professor Wood and Professor Whitney and had been closely associated with the then medical examiner of the district.

Politics in many cases are behind the appointments but the system is often better than the appointees.

The districts were originally laid out in the 'horse and buggy' days with so limited a number of cases in the districts with small population that the medical examiner could never become proficient by practice.

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lation should be enlarged in this "automobile age" to produce better efficiency.

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I am at present working on a case the autopsy on which showed fracture of the base of the skull, multiple fractures of the bones of both legs and arms and fractures of several ribs with widespread crushing and hemorrhage of the soft parts. The police obtained the story that the victim was on his way home and was crossing the street when he was struck not once but three different times by passing automobiles. He was finally rescued still living but unconscious, and he died on the way to the hospital.

Dr. Moriarty, the Medical Examiner, made an autopsy and was inclined to pass the case as an automobile fatality but the local chief of police had inquired into the circumstances of the victim's life and had learned (1) that he had been insured very recently for a considerable sum of money and (2) that he had been given a solution said to be silver shortly prior to the accident. Upon receipt of this information Dr. Moriarty decided to have the organs submitted to a chemical examination. The analysis revealed a lethal amount of arsenic ingested most probably as Fowler's solution. The victim died of course as the result of his being run over, but a profound arsenical intoxication of the system was undoubtedly the cause of a mental condition which made it possible for him to be struck by three different automobiles.

I would like at this point to show you how easily the poison may be obtained.

For some twenty years now the 1 per cent solution of potassium arsenite flavored with compound tincture of lavender which is known as Fowler's solution has been the favorite weapon of the poisoner. But how does he obtain it?

We have in Massachusetts a statute which requires every person who purchases Fowler's solution without a physician's prescription to sign his name and address in a 'poison book.' Now, if by chance the purchaser is not known to the druggist he can sign of course a fictitious name and address. But even when this happens, there is still the handwriting for the police to work on. It would seem therefore that if the statute were obeyed it might offer a certain measure of protection against the indiscriminate sale or purchase of Fowler's solution. But how does it work out in practice?

In my investigation of the case which I have just described I needed some Fowler's solution for certain corroborative tests and I went to a drugstore in downtown Boston and without any trouble purchased an ounce of the preparation. I paid the clerk and left the shop. I returned at once, however, and as if it were an afterthought asked the clerk if he did not want me to sign the poison book? He seemed slightly embarrassed but answered 'Yes of course.' I signed at the place he indicated to me and then looked through the rest of the book. I found that mine was the only signature it contained. Reading my thoughts the clerk said, 'None of the druggists ask you to sign for Fowler's solution or any other poison for that matter.'

With such a state of affairs it is, of course quite impossible for the police to prove a purchase or sale of this poison. To be of any use the statute should be rigidly enforced in the first place, and, in the second in addition to its present provisions it should require I think the same identification of a would-be purchaser as is required by a bank or post office where he is not known.

## ANOXEMIA IN PREMATURE INFANTS\*

### A Clinical Study

BY WILLIAM P. BUFFUM, M.D.†

**T**HE purpose of this paper is to show that there is evidence that many, if not all, of the small premature babies that do not do well during the first month of life are anoxicemic, and benefit by an increased oxygen content in the inspired air. In the premature nursery at the Providence Lyng-In Hospital since January 1, 1933 we have used the Burgess oxygen box with strikingly good effect.

A review of the literature brings out certain points about anoxemia, cyanosis and oxygen administration. Although the authors were mostly dealing with adults, the points have a distinct bearing on our problems.

1. Little practical benefit is obtained from the administration of oxygen, if the hemoglobin already has the normal content of oxygen.<sup>1</sup> Under ordinary circumstances the hemoglobin is 97 per cent saturated, giving added oxygen might add 3 per cent to the hemoglobin and a small amount would go into solution in

the plasma. This slight increase in the oxygen content of the blood could not be important.

2. A moderate anoxemia cannot always be recognized by visible cyanosis.<sup>1, 2</sup> Usually cyanosis of the fingernails and lips that is barely recognizable corresponds to a 10 per cent decrease in hemoglobin oxygen. Marked cyanosis indicates a 20 per cent decrease. These figures, however, are extremely unreliable in certain conditions, as the intensity of the cyanosis depends on the actual amount of unoxidized hemoglobin in the capillaries of the skin. In any condition where the amount of blood in the superficial capillaries is small, the anoxemia must be much more extreme to cause visible cyanosis. Surgical shock and asphyxia pallida of the newborn are extreme examples of lack of superficial circulation.

Another illustration of this principle is the well-known fact that in the presence of a marked anemia cyanosis does not readily appear. When there is only a small amount of hemoglobin in the skin capillaries, a marked anoxemia is shown by a dusky gray color, an appearance familiar to all physicians and rec-

\*Read at the meeting of the New England Obstetric and Gynecological Society at Providence R. I. May 28, 1936.

†Buffum, William P.—Visiting Physician, Pediatric Service, Rhode Island Hospital. For record and address of author see This Week's Issue, page 408.

ognized as usually indicating a very serious condition. Internists are thoroughly familiar with this condition, as it is of importance in deciding when to use oxygen especially in pneumonia.

3 Anoxemia has been shown to be injurious both clinically and experimentally. It has been evident that anoxemia patients, especially in pneumonia, do much better during oxygen administration. In some clinics oxygen is being used extensively for postoperative treatment; it is said to be especially useful after spinal anesthesia.<sup>1</sup> Experimentally it has been shown that the heart tissue and the mesentery become swollen with edema if deprived of the normal oxygen supply.<sup>4</sup>

The time factor is of importance. A definite cyanosis for a few minutes on the operating table may be of no importance whatever, but a very slight cyanosis over a period of days is likely to be seriously harmful.<sup>1</sup> An interesting feature of chronic cyanosis is the ability of the patient in certain cases to develop a defense mechanism which makes the anoxemia comparatively harmless. This is illustrated by patients with chronic valvular disease, and even more strikingly by cases of congenital heart disease. These patients can, in some cases, live almost normal lives with a constant marked cyanosis. However, this phenomenon does not affect the fact that a suddenly developing and prolonged cyanosis is seriously harmful.

4 In general if oxygen is needed it should be given continuously and not intermittently. As Boothby<sup>4</sup> says: "Either the patient needs or does not need oxygen; if the former he should be getting it all the time, if the latter the oxygen is too expensive to waste and, in addition, it may interfere with and divert attention from other therapeutic measures." This does not mean that the giving of oxygen for a short time in cases of sudden cyanosis is not beneficial; obviously oxygen given through a mask is often a life-saving measure. The point is that one should look for signs of a less evident anoxemia before and after the occurrence of urgent symptoms.

With these four points in mind let us consider the premature baby. The neonatal death rate in premature babies is high. During the first few hours the greater number of deaths occur, but for the first month a good many of these babies live a very uncertain existence. The outstanding symptom is usually cyanosis occurring in attacks of short duration but between attacks the baby is pale and often has a gray appearance. Very frequently if the baby comes to autopsy a brain hemorrhage is found. If he lives usually there is later no demonstra-

ble sign of brain injury.<sup>5</sup> Atelectasis is a common finding at autopsy often with brain hemorrhage if the baby dies in the first few hours, often complicated by pneumonia if the baby dies later. The treatment of the atelectasis by giving oxygen and carbon dioxide has been repeatedly urged by Henderson.<sup>6</sup> I need only speak of it here to say that continuous oxygen in no way interferes with periodic oxygen and carbon dioxide treatment.

Since January 1933 we have been using two Burgess oxygen boxes.<sup>7</sup> Premature infants in poor condition are put in as soon as they arrive from the delivery room; they are kept there until their condition is satisfactory, and are put back again if they become cyanotic. The immediate effects of this treatment are often striking, as would be expected.

In addition to this emergency treatment we have made a practice of giving continuous oxygen to babies that do not gain in weight. We give oxygen for that reason alone, although on closer inspection these babies are found to have poorer color than the others. After being put in oxygen the babies are likely to improve markedly.

Those who are several days old and not moribund regularly become pinker in color. The chart usually shows a weight gain beginning with the oxygen treatment. The marked improvement in color which usually takes place when the babies are put in the oxygen box, seems to indicate definitely that they were anoxic before the treatment was begun.

Conde and I<sup>8</sup> published the charts of the first two babies treated in this way in 1933 and the gain in weight was very striking. I have here also the charts of the babies treated with oxygen during the last three weeks showing the improved nutrition resulting from oxygen administration.

The continuous use of oxygen for premature infants is relatively new. Boothby and Amberg added oxygen equipment to the Hess bed, and Amberg<sup>9</sup> published results in February 1934. He used oxygen on six babies over periods of from two to four weeks and reported that this treatment diminished the frequency and severity of cyanotic attacks and was life-saving. Hess<sup>3</sup> has for several years been using an enclosed heated bed with oxygen. He reported<sup>10</sup> that he uses it for "all infants weighing under 1200 gm. those showing respiratory and cardiac embarrassment and all others who it is believed might be benefited by oxygen therapy." He also reported<sup>11</sup> "We believe we have resuscitated a fair percentage of babies who otherwise might not have lived and we do believe our pneumonia statistics are very much better."

Although continuous oxygen is being widely used for resuscitation and cyanotic attacks, I

believe that it has not been recognized that many if not all of the premature infants that do not do well during the first few weeks of life are anoxicemic and are benefited by continuous oxygen treatments

#### SUMMARY

Evidence is shown that seems to indicate that many, if not all, premature babies that do not do well during the first month of life are anoxicemic. The points made are as follows

- 1 Oxygen is of no benefit if the baby is not anoxicemic
- 2 In conditions in which the circulation in the skin capillaries is decreased, cyanosis is not noted until the anoxemia is extreme
- 3 Slight continued anoxemia is injurious to the patient
- 4 If the patient is suffering from anoxemia, continuous administration of oxygen is indicated
- 5 It is well known that premature babies that

have cyanotic attacks are benefited by oxygen

6 We have found that premature babies that do not gain in weight during the first month of life are helped by oxygen. Both the pink color of the skin and the improvement in nutrition show that these babies have been relieved from a condition of anoxemia.

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## MUCOCUTANEOUS SYPHILIS (BEJEL) IN SYRIA

### The Results of Dark Field Examination

BY ELLIS H HUDSON, M D †

**B**EJEL is the name given by the Arabs themselves to a disease which is found very commonly among the semi-nomad villagers along the banks of the Euphrates river. It is usually contracted in childhood and manifests itself first as an eruption of the skin and mucous membranes. This stage usually passes without apparent organic damage, but inflammatory sequelae usually appear at some subsequent time in the skin, the nasopharynx, or the periosteum of the long bones.<sup>1</sup>

Although not a venereal disease<sup>2</sup>, and not productive of apparent lesions in the nervous, cardiovascular, or other interstitial organs, *bejel* has been assumed to be a treponematosi<sup>3</sup> and those physicians who have had experience with it have called it syphilis.

This assumption is based upon the fact that the early lesions of *bejel* resemble the secondary eruption of venereal syphilis, the disease, like syphilis, has the property of long and apparently complete latency, and the late lesions of *bejel* physically resemble syphilitic gummata of the skin, nasopharynx, and long bones. The assumption is further strengthened by the fact that *bejel*, once contracted, produces positive precipitation and complement fixation reactions in the blood,<sup>4 5 6</sup> which remain positive throughout the latent period. Furthermore the anti-

syphilitic drugs, notably mercury, bismuth and arsenic, are highly effective against the lesions and symptoms of *bejel*.

However, crucial evidence of the treponematosi<sup>7</sup> etiology of *bejel* was lacking until recently, when, with the use of the dark field,\* we have been able to demonstrate the presence of spirochetes of the characteristic morphology and motility of *Treponema pallidum* in the lesions of fresh *bejel* infections. The object of this paper is to report on our first fifty positive dark field examinations.

While *bejel* is largely a disease of the semi-nomad Bedouins, its incidence among the adults being around 90 per cent, it is also found to a lesser degree among the Arab townspeople living in Deir ez-Zor and the small towns along the Euphrates. The conditions for the propagation of childhood syphilis are not so favorable in the town as they are in the Bedouin huts and tents, and consequently one finds evidence of syphilis in only a third of the adult townspeople.

*Bejel* is practically unknown among the Christians, who number in this region about 5,000. Venereal syphilis, however, is present to the extent of about 10 per cent of the adult Christian population, and this form of syphilis

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\*A dark field apparatus has been provided through the generosity of the Ella Sachs Plotz Foundation for the Advancement of Scientific Investigation and through the interest of personal friends.

is so clearly differentiated from bejel that it is given an entirely different name, being known as franghi, or the foreign disease

#### MATERIAL

We have divided the fifty cases into four groups of patients. The first consists of thirty-four Bedouins who recently had contracted non-venereal syphilis (bejel). The second consists of two Arab townschilren who had fresh lesions of bejel. The third group consists of three Christians, two of whom had contracted venereal syphilis (franghi), the third Christian was of especial interest, as his syphilis was of the bejel type. The fourth group consists of eleven Bedouins who had had bejel over a long period.

*Thirty-four dark field positive cases in Bedouins with recently acquired bejel.* On being asked what his trouble is, the Bedouin patient often replies, "You know better than I do." But he does not say this when he has contracted bejel, a disease which he always diagnoses himself. These thirty-four patients or their parents all gave their own diagnoses spontaneously.

Sixteen were females and eighteen males. Twelve were in the first decade of life, the three youngest being one year old. Four were in the second decade, eleven were in the third decade, there were two each in the fourth, fifth and sixth decades, and the oldest was a grandmother sixty years old.

Of twelve cases which were subjected to the Kahn test in Deir-ez-Zor, the readings were two with 2+, three with 3+ and seven with 4+. Nine of these twelve sera were tested in the laboratory of the American University of Beirut and all gave readings of 4+ in both Kahn and Kolmer Wassermann reactions.

The source of the specimen for the dark field examination in twenty was a patch on the mucous membrane of the mouth, in eight a papule on the trunk or extremities, and in six a papule on the vulva or scrotum. The following are two illustrative cases, a child and an adult.

(1) The child was a boy three years old well developed and well nourished. His rectal temperature was normal. He had had an eruption in the mouth for two months which his mother called bejel. His older brother had had it just before he did. He presented grey circular or oval, slightly elevated patches on the inside of the lips and on the tongue and pharynx. These were sensitive and bled easily and saliva drooled from the half-open mouth. All the superficial chains of glands were palpable. Otherwise the physical examination was negative. There was no eruption whatever on the skin nor about the other orifices of the body. The entire absence of skin lesions in this case is not typical. A specimen from one of the lip patches was positive for spirochetes. In the following eight days he received 0.25 Gm bismuth metal intramuscularly. The lesions began to fade immediately and were entirely gone at the end of the period.

(2) This was a man aged about fifty a father of five children of whom four were living. His wife had never miscarried. His oral temperature was normal. His stools contained hookworm ova. He had never before had bejel but stated he had contracted it six months before from his children who were then recovering from the disease. The eruption appeared first in his mouth then he began to have pain in the legs and a general skin eruption. Headache and hoarseness followed. He was limping from the pain in his legs and knees.

He presented crusting lesions of the scalp, arms, legs, and trunk. The papules of the trunk were single or in grouped patches. He had one soft papule on the scrotum under the penis. He was extremely hoarse, and the fancies were congested. He had swelling with tenderness and roughening of both tibiae. He also had a painful swelling of the left index metacarpal and the lower epiphysis of the right ulna. Both knee joints were swollen and tender.

His Kahn in Deir-ez-Zor was 2+, and his Kahn and Kolmer Wassermann in Beirut were both 4+. A dark field specimen from the scrotal papule was positive. He received 0.60 Gm metallic bismuth in the following five days and then dropped treatment. He returned five weeks later and it was noted that his hoarseness was less, his bone lesions less tender and all skin lesions either gone or much drier and smaller.

Returning to the series of thirty-four such patients, six did not know the source of their infection. In such cases the Bedouin usually says he got it "from God." In twenty-five cases the patient traced the infection to children who had the disease and with whom he had been in contact, usually in the same hut or tent. Three thus got it from a brother, four from a sister, four from a son, three from a daughter, one from his children, one from a granddaughter, two from a cousin, one from a nephew, one from his wife who got it from her young sisters, and five from a neighbor's children.

The three remaining cases were relatives and it is possible to trace the course of the infection. No. 7810 a man of twenty-eight, seen in April had had bejel lesions for six months having contracted the disease from a cousin's household. He was treated in the clinic and his lesions were apparently healed. But his wife had already contracted bejel from him and later passed it on to No. 8433 her sister who came to the clinic in October having had bejel for four months. With her was her youngest child No. 8427 aged one and a half years who had very fresh lesions having just contracted the infection from his mother. This last sequence is unusual our experience being that where parent and child have a concurrent infection the parent has usually contracted the disease from the child.

As to the length of the illness at the time of the examination two had had it for ten days, four for two weeks, one for a month, four for two months, one for three months, two for four months, two for five months, eight for six months, one for eight months, one for ten months, three for a year, two for several months, and three had contracted the disease "recently."

The lesions and complaints for which the thirty-four patients came were as follows:

patches on the mucous membranes of the mouth in twenty-nine, papules on the trunk and extremities in twenty-two, papules on the vulva, scrotum, or about the anus in seventeen, ulcer of the tonsil in one, laryngitis in four, macular rash in two, tibial periostitis in one, arthritis of the knees in one, and headache and general bone pain in seven.

The temperature at the time of admission was recorded in twenty-eight cases. Six of these were rectal temperatures in children, of which one was below  $37^{\circ}\text{C}$ , four were between  $37^{\circ}\text{C}$  and  $37.5^{\circ}\text{C}$ , and one was  $38^{\circ}\text{C}$ . Of the twenty-two oral temperatures nine were  $36.9^{\circ}\text{C}$  or below, eleven between  $37^{\circ}\text{C}$  and  $37.5^{\circ}\text{C}$ , and two were  $37.7^{\circ}\text{C}$ .

As to prior treatment none had received injections of any kind and none had inhaled mercury. Two had touched the lesions with copper sulphate.

As to our treatment of the thirty-four cases, two received none and the result in six is not known. The remaining twenty-six completed short series of bismuth injections. They stayed under treatment a total of 284 days, an average of eleven days. They received a total of 190.5 cc intramuscular bismuth, or an average of 0.75 Gm of the metal. In only two of the twenty-six was an intravenous arsenical used, totaling for the two 1.35 Gm.

Eight of the twenty-six patients were partially relieved of their complaints. In eighteen cases the lesions were healed or healing when last seen, and the patients were greatly relieved.

#### *Two dark field positive cases in town children*

(1) A male infant of two and a half months with papules on the tongue and around the genitalia and anus. Both parents had bejel in childhood. The mother recognized the condition as bejel but did not know the source. He had received no treatment when seen. The dark field specimen was taken from the perianal papules. The lesions began fading after 0.10 Gm bismuth metal had been given intramuscularly. When the child had received less than 0.25 Gm bismuth metal his mother considered him well and refused further treatment. The child was seen six weeks later and seemed perfectly well.

(2) A girl of fourteen with ulcerations of both tonsils and patches on the tongue and other areas of the oral mucous membrane. Her oral temperature was  $37^{\circ}\text{C}$  and she had had no prior treatment. The previous duration of illness was ten days. The patient's duty in her home was to care for her youngest brother, an infant who had just returned with bejel after being wet-nursed for a while in a Bedouin village. The patient received 0.80 Gm of bismuth metal in the course of fifteen days. All lesions were healed.

#### *Three dark field positive cases in Christians*

(1) Two of these were man and wife aged respectively twenty-seven and twenty-five residents of Deir ez-Zor. The man had had gonorrhea seven years before. He had a venereal exposure in Beirut three months before examination and subsequently developed some papules on the penis which were given

local treatment. He had no symptoms and only came at our request on account of his wife's condition. Upon examination three small papules were found on the frenum of the penis. A specimen taken from one of these was positive in the dark field. His Kahn reaction was  $4+$  in the Deir ez-Zor laboratory. The lesions disappeared soon after treatment with bismuth and arsenicals was begun.

The wife came complaining of eruption in the palms and burning in the perineum present for one month. She was found to have multiple condylomata of the vulva and anus, vesicular and desquamating eruption of the palms and a fine macular rash on the thighs. Her oral temperature was  $36.6^{\circ}\text{C}$ . Her Kahn reaction three years before had been negative. It was now  $4+$ . A dark field specimen from a vulvar lesion was positive. The lesions disappeared soon after treatment with bismuth and arsenicals was begun.

(2) A young man of thirty who had been living in a room in the house of a family of Arab townspeople. He did not know whether there was bejel in the household. He denied venereal exposure either there or elsewhere.

Five weeks before admission to the clinic he began to have irritation in the perineum, increasing in severity. Subsequently he developed an eruption of the trunk and soreness of the throat. Examination revealed patches on the right tonsil and left buccal mucous membrane, papules on the sulcus of the penis, the scrotum, the perineum, and about the anus, a roseola of the trunk and a desquamating eruption of the palms and soles. Dark field examination of a papule on the scrotum was positive. The lesions disappeared soon after treatment with bismuth and arsenicals was begun.

*Eleven dark field positive cases in late bejel in Bedouins.* We have now eleven further cases of positive dark field in Bedouins whose history of bejel goes back several years. Ten of these dated their original infection from four to thirty years before, with an average of sixteen years. The eleventh was a woman said to be eighty, who had lesions which looked like fresh bejel infection. She was not sure if she had had bejel in childhood.

Five were males and six females. The youngest was six years old, one was sixteen, one seventeen, and one twenty-six were in their thirties, and the oldest was the senile blind woman said to be eighty.

Four of the eleven cases were subjected to the Kahn reaction in Deir ez-Zor, one being  $3+$ , and three  $4+$ . Two of the latter were also tested in Beirut and both gave  $4+$  in both Kahn and Kolmer Wassermann reactions.

The source of the specimen in which spirochetes were found was as follows: four from pharyngeal ulcers, two from ulcers of the gingiva, and one each from ulcer of the nares, papule of vulva, papule of scrotum, patch on tongue, and patch on uvula.

The history and lesions presented by the eleven cases were as follows:

(1) Ulcer of the pharynx, duration one month. Had a skin ulcer of the hip two years before. Original bejel over seven years before at the age of thirteen.

(2) Ulcer of the hard and soft palate duration three months Original bejel six years before at the age of twenty four

(3) Ulcers on the hard palate and left tonsil papular skin eruption headache and bone pain Had had such lesions on and off since original bejel six years before at the age of twenty four

(4) Patches on the tongue hoarseness and dyspnea, duration one month Original bejel at the age of two four years before

(5) Ulcer on the soft palate and multiple perioral lesions Duration of sore throat one month of bone lesions ever since original bejel in infancy sixteen years before

(6) Ulcer of the left nares and pharyngeal cicatrix and old periostitis of tibiae Duration of first six months of second eighteen months and of third much longer Original bejel in childhood thirty years before

(7) Perforating ulcer of the soft palate of recent origin Original bejel in childhood twenty five years before

(8) Patches on the tonsils and papules on the scrotum and arms Duration of former three weeks of latter ten days Original bejel in childhood thirty years before

(9) Patches on the uvula and tonsils duration three months Possibly had bejel in childhood seventy five years before

(10) Ulcers of the gingiva and both tonsils duration two months Had bejel in childhood ten years before

(11) Ulcer of the gingiva duration two months Had bejel in childhood thirty years before

Only one of the eleven cases had received prior treatment Case 1 had had three injections of some sort for the hip ulcer two years before Nine of the eleven submitted to treatment in the clinic long enough to secure definite healing of the lesions constituting the chief complaints The nine cases remained a total of 111 days an average of twelve days each They received a total of 82 cc intramuscular bismuth an equivalent of about 8 grams of the metal and an average of 0.90 Gm each

#### COMMENT

A majority of the fresh bejel cases were adults This is not in keeping with the distribution of these cases in the general Bedouin population The explanation is that adults often seek treatment whereas parents of children with bejel usually regard treatment of this "self limiting" childhood disease as superfluous

In the first thirty-six cases described comprising thirty-four Bedouins and two towns children the course of events is clear The subject when seen had a recent infection with syphilis which manifested itself in lesions mostly of the skin and mucous membranes The longest time elapsing between the original infection and the time of examination was one year No treatment had modified the course of the disease The high proportion of Bedouins as compared with townspeople in this group is in keeping with their relative bejel morbidity

A further fact must be emphasized These

thirty-six cases were the total number of such cases which were examined with the dark field The finding of numerous spirochetes of the morphology and motility of *Treponema pallidum* was constant in these early cases of bejel, none that we examined had a negative dark field

The treponemata of the two cases of venereal syphilis (franghi) were indistinguishable in the dark field from those found in the bejel cases

The case of the young Christian man who contracted bejel is of great interest A conclusion cannot be drawn from one case, but it would seem that bejel runs true to form even when contracted by an individual outside of the Arab-Bedouin community One would have expected to find an "initial lesion" in his case There is a suggestion here that there is a biologic difference between the viruses of bejel and franghi and that it is not altogether a question of difference in "soil"

Now we turn to the eleven cases cited last above We are here again dealing with Bedouins who have nonvenereal syphilis But here the history is much longer and the course of events not so clear The original infection dates back an average of sixteen years In some cases there was a period of good health and then a suddenly appearing "late" lesion In others there were lesions of various kinds appearing at intervals throughout the whole period of the disease

Some of these late lesions were similar in character to those from fresh bejel infections, such as patches and papules These were probably mucocutaneous relapses Others were perhaps gummata expression of the allergic state of the late stage of the disease

We were able to find spirochetes in only eleven of such late cases of bejel, although many more than this number were examined with the dark field The spirochetes were also much less numerous This infrequency or scarcity of spirochetes is in contrast to the constancy of the positive dark field in early cases It is our impression that, given time and patience it would be possible to demonstrate spirochetes in a large proportion of these late lesions There is clinical evidence that these late lesions of bejel are very infectious

In view of the extreme difficulty experienced elsewhere in getting a positive dark field from gummata in late venereal syphilis it is probably remarkable that we were able to collect as many as eleven cases of positive dark field in late cases of bejel within a short time Probably the cases of relapse furnish most of the positive specimens and the gummata of allergic origin conform more nearly to gummata examined elsewhere in their infrequent exhibition of spirochetes

## SUMMARY

(1) Dark field studies of bejel are herewith reported for the first time

(2) Spirochetes of the morphology and motility of *Treponema pallidum* were found constantly and abundantly in the lesions of freshly acquired bejel, whether in children or adults. This is crucial evidence that this disease of the Bedouins is a treponematosis

(3) Characteristic spirochetes were also found, but less constantly and less abundantly, in cases of late bejel. Most of these were probably instances of mucocutaneous relapse, and it would seem that relapse in acquired syphilis of childhood is more common than in venereal syphilis

(4) The spirochetes of bejel were indistinguishable from those of two cases of venereal syphilis (franghi)

(5) Protocols of typical bejel cases are given. They show that bejel (1) is highly contagious and is usually contracted by and from children, (2) is an afebrile malady with little

effect on the general constitution, (3) usually exhibits mucous and cutaneous lesions in the early cases, with occasional involvement of the periosteum, (4) retains the activity and contagiousness of the early lesions up to one year or more, (5) often becomes contagious again many years later in mucocutaneous relapse, (6) is uniformly accompanied by positive precipitation and complement fixation reactions in the blood, and (7) responds very favorably and very quickly to intramuscular bismuth therapy.

The apparent absence in bejel of the initial lesion known as chancre in venereal syphilis, is noteworthy

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## VERMONT STATE MEDICAL SOCIETY

## HYSTEROPTOSIS\*

BY OLIVER N. EASTMAN, M.D.†

AT the New England College of Surgeons' 1934 meeting I reported fifty cases of vaginal hysterectomy, comparing the relative merits of this operation with fifty hysterectomies done by the abdominal route. Since that time, I have added to my series fifty-five more vaginal hysterectomies. The major indication was for relief of complications arising from ptosis of the uterus of a greater or lesser degree.

Ptosis of the uterus is the most common of uterine displacements in women who have borne children. The disability resulting varies in degree from slight discomfort to the development of malignancies incident to this condition. A woman may have an extensively lacerated perineum and suffer little or no discomfort so long as no rectocele pocket is present, but lesions of the anterior wall are quite different in this respect. A sensitive uterus, a dull ache in the pelvis, frequency of urination, urine escaping on lifting or coughing, the presence of residual urine, bladder discomfort, backache and nervous irritability may accompany a slight degree of prolapse of the uterus. This condition may even escape the notice of the examining physi-

cian unless the patient is examined in a standing position.

Cystoscopic examination in these cases reveals a congested trigone, which in itself gives distressing bladder symptoms even though no bladder infection is evident. It is fair to presume that cystitis is more prone to develop in bladders whose anatomic relations to the other pelvic structures have been altered. This is evidently not an axiom, however, for one encounters all grades of bladder displacement with no evidence of inflammatory changes, even in cases of long duration.

We were formerly taught that the incidence of malignancy superimposed on an ulcer of a prolapsed uterus was rare. But when biopsies are made of the ulcerated area, the presence of cancer is frequently discovered. Emmett and Taussig in a recent article reported ten cases of complete prolapse with malignancy developing in four.<sup>1</sup> In my series I have found malignant disease in three cases, one of which was very advanced. These do not include uterine cavity malignancy of which there were four cases. It one accepts the chronic irritation theory as an important factor in cancer causation and adds chronic inflammation due to lacerations and injury, conditions would seem to be ideal for the development of carcinoma of the cervix. Such

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an explanation certainly appears more plausible than Cohnheim's theory of misplaced embryonal tissue and the infection and parasitic theories. Leukoplakia, an increase in the upper two layers of the cervical epithelium, frequently precedes the development of cancer. Hinselman considers this so important that he recommends radical treatment in every case, stating that 30 per cent will develop cancer.<sup>2</sup> The presence of leukoplakia and cancer on a completely prolapsed uterus is certainly not common but it should not be assumed that cancer cannot develop.

Many factors are mentioned in the etiology of uterine prolapse. It is usually a lesion of parous women and is the result of some injury sustained during parturition. In the nulliparous woman, it may result from tumor pressure in the pelvis or be incidental to atrophic changes in connection with the menopause. A weakened, damaged and relaxed pelvic floor, increased weight of the uterus and increased intra-abdominal pressure are provocative factors. Fothergill asserts that an atrophy and degeneration of the fibrous and muscular elements of the lateral masses of subperitoneal tissue occasion prolapse and that the lower parts of the paravaginal and paravesical tissues alone are affected.

Any or all of the pelvic structures may be involved in the descent of the uterus—the vaginal walls, the bladder, and the rectum especially. The process usually extends over a period of months or years in its development.

Modern obstetrical care is required in the prophylaxis of procidentia. The primary repair of all lacerations is quite essential. These include cervical, anterior wall and pelvic floor lacerations. One who has practiced obstetrics in the homes of patients can readily appreciate the difficulty involved in the satisfactory repair of these lesions. Inadequate assistance, insufficient light and lack of facilities, including asepsis, are only a few of the obstacles to be overcome. Subinvolution should be guarded against. Breast feeding and suitable time in bed to allow for the healing of lacerations, the knee-chest position and the use of mechanical support when indicated are points which should not be overlooked. Add to these the avoidance of accumulative masses of feces in the bowel especially impaction, distention of the bladder, the development of anemia or debility and the avoidance of fatigue and we have done much for the patient.

#### NONSURGICAL TREATMENT

Nonsurgical treatment is of little relative value. One is justified in resorting to mechanical appliances for the relief of cases with distressing symptoms and also in cases where sur-

gical treatment is contraindicated. To render temporary relief may be the means of delaying operative treatment until conditions develop that make it ill-advised or impractical for surgical correction. One too frequently encounters malignant changes which have arisen as the result of previous treatment. I allude to traumatization of the cervix causing a chronic inflammation from which a tumor has developed. Both pressure and inflammation are apparently provocative of such. The dread or fear of surgical treatment and inability to find a convenient time for an operation has a decided tendency to delay correction permanently when some little relief is given by mechanical support. This impresses me as being so important that one is scarcely justified in affording temporary relief without making it clear that it is not lasting and something more radical is imperative. Patients go on for years with a vaginal discharge and discomfort incident to pessaries simply because they are relatively benefited.

The doughnut type of pessary of hard rubber gives the best service in selected cases. Tampons are helpful, chiefly as temporary support and in healing of ulceration preliminary to operation. Ball pessaries of hard rubber are most serviceable in elderly women. Both types are readily removed and cleaned by the patient, and she should be instructed of the necessity of so doing. Occasionally the surrounding tissue adjusts itself so securely to a hard rubber pessary as to make its removal exceedingly difficult. Soft rubber pessaries especially the inflated type become foul and irritating. Stem pessaries attached to a belt, to be worn during the day, are preferable when the hard rubber pessary cannot be used.

#### SURGICAL TREATMENT

Demonstrable lesions, especially when associated with discomfort are indication enough for surgical intervention. A sagging bladder or an extensive prolapse, even in the absence of distressing symptoms usually should be subjected to operation. The results from properly performed surgical operations are uniformly good so much so that chronic invalids are frequently restored to good health.

The choice of operative procedure should depend upon the pathology, the patient's age and the possibility of future pregnancies. No one type of operation is best employed routinely. In younger women vaginal repair combined with abdominal correction of retrodisplacement of the uterus, usually a Gilliam type operation, is indicated.

After the childbearing age a Watkins interposition operation is favored by many men in well organized clinics. Everett,<sup>3</sup> an enthusiastic advocate, prefers this operation to vaginal hysterectomy, and in a recent article defends his

position by reporting five unsatisfactory results in twenty-six cases, seventeen of which were followed up. It would seem pertinent to question the technic employed, as such results are hardly consistent with results obtained by surgeons generally. The Watkins operation is especially desirable in elderly women whose condition demands a minimum of operative procedure. A combined vaginal operation and ventral fixation is favored by many general surgeons. It requires rather less surgical skill and the results are satisfactory in many cases. I am impressed, however, with the number of failures that evidently follow this operation, for eight women, classified as third degree prolapse in my cases, had had a previous ventral suspension operation.

The Fothergill operation finds much favor, in Canadian clinics especially, and I should expect equally as good results as in the Watkins operation, for its limitations are practically identical.

One must bear in mind that a complete removal of the cervix is accomplished in a vaginal hysterectomy, removing the possibility of a latent cervical malignancy. Woolston<sup>4</sup> mentions nineteen cases of cancer developing in 1014 patients out of 2420 of Pemberton and Smith's cases in a ten-year follow-up, an incidence of 1.8 per cent. Meigs reports 1.6 per cent in his series of cases and concludes that cervical repair is not a perfect prophylaxis. It is doubtless true, however, that cervical repair and cauterization and especially amputation of the cervix are well worth-while in the prevention of cancer. Nevertheless, cancer has been reported to follow each procedure. Heaney<sup>5</sup> recently reported a series of 627 vaginal hysterectomies for benign disease with three deaths. Hospitalization averaged 12.03 days. He concludes by stating that vaginal hysterectomy should be more frequently performed. Never has there been a series of abdominal hysterectomies with so low a mortality and morbidity rate.

Complete uterine prolapse calls for vaginal hysterectomy with repair of the cystocele and relaxed perineum to obtain the best results. The easy cases require scarcely more than thirty minutes, while the more difficult cases require about an hour. As I became more conversant with the technic employed and more favorably impressed with the results obtained, I found myself doing more vaginal hysterectomies and fewer of the less radical operations. In spite of the slight amount of added risk the better results obtained justify this decision.

The technic employed differs only in minor details from the classical operation. The parametrial supports and lateral ligaments of the uterus are securely approximated to their fellows on the opposite side and the anterior part

of the body is utilized to provide support to the bladder by closing the vesicocervical space. In reality the point of bladder hernia. The remaining portion of the mass with proper suturing provides support for the lateral and posterior vaginal vault. A radical repair of the rectocele and relaxed perineum is essential to provide support and to construct a suitable vagina.

A consideration of the anesthesia to be employed seems pertinent, for many elderly women who are classed as scarcely average or poor risks are operated on under the influence of narcotics and local anesthesia. Barbitol, gr 10 is administered at eight the preceding evening with nembutal, gr 3, and scopolamine, gr 1/150, to follow in the morning, three hours preceding the scheduled time of operation. Scopolamine, gr 1/250, and nembutal, gr 3, are given one and a half hours later, if the patient is not sufficiently narcotized. Morphine, gr 1/8, and atropine, gr 1/150, are administered one half hour preceding the operation. One per cent novocaine, injected into the perineal body and tissues lateral to the cervix, effects a satisfactory anesthesia as a rule. Exceptionally a patient becomes restless and unmanageable. Then nitrous oxide and oxygen gas is added, with ether if required. Spinal anesthesia and avertin as a basal anesthetic have been used in several cases. Personally I prefer narcosis.

An attempt has been made to condense and tabulate the last 105 consecutive cases of vaginal hysterectomy on which I have kept records. The fact that my cases of hysteroptosis were treated by this procedure merits such consideration.

TABLE 1  
AGE INCIDENCE

1	between ages of 25 to 30
22	30 to 40
33	40 to 50
24	50 to 60
19	60 to 70
6	70 to 75

TABLE 2  
INDICATIONS FOR OPERATION

Fibromyoma of the uterus	39
Menorrhagia uncontrolled	24
Prolapse of the uterus, 1st and 2nd degree	46
3rd degree	12
Lacerated and infected cervix	38
Cystocele	50
Malignancy	7
Uterine polyp	5
Sterilization	3
Rectocele present	41

#### GENERAL NOTES

Large leiomyomas requiring morcellation were noted in seven cases. In one case the

uterus was divided into fifteen pieces in order to effect its removal

Fifty-four patients developed a temperature of  $100.6^{\circ}$  or over at least once following the operation. This usually occurred on the second postoperative day and practically every patient had a slightly elevated temperature at this time. Only fifteen patients showed a temperature of  $101^{\circ}$  for more than one day.

The first fifty vaginal hysterectomy cases were drained vaginally with a small collapsible rubber drain inserted into the dependent peritoneal cavity. Twenty-four of this series had a temperature of  $100.6^{\circ}$  for at least one day. The second series had no drain and thirty showed a similar rise in temperature. No notable difference was evidenced during the convalescent period.

The average time of hospitalization was sixteen days postoperative. All but eight patients left by the nineteenth day and but one patient was required to stay beyond this period.

#### COMPLICATIONS

One patient required an abdominal incision after the removal of the uterus vaginally. A large leiomyoma became separated from the fundus of the uterus. It occupied a high position and its removal was facilitated by the abdominal route.

Cystitis was the most frequent complication noted postoperatively. A retention catheter was used in all cases when the condition existed before operation and also in cases of extensive bladder denudation to prevent frequent catheterization.

One case of pelvic peritonitis, two cases of postoperative pleurisy and two cases of rectal fecal impaction were added complications.

Three deaths occurred, establishing a mortality rate of 2.8 per cent. One patient forty-nine years old, died of surgical shock eight hours postoperatively as transfusion was about to be given. She presented an extensive case of hyperplastic and polypoid endometritis with a history of two months of bleeding. There was no postoperative bleeding. At autopsy extreme anemia of the viscera was found. Doubtless hypodermoclysis added to her anemia. The second patient, aged sixty-six, a debilitated old lady, developed pneumonia and died six days postoperatively. The third patient, aged sixty-eight, died of emboli on the seventh day postoperatively. She had made a satisfactory convalescence up to that time.

#### END-RESULTS

An attempt has been made to ascertain the results of operation by a six-month follow-up letter and to date but one case of recurrence of protrusion of pelvic structure has been noted. This is a patient who acquired a persistent cough soon after an extensive repair of a cystocele associated with her hysterectomy. The protrusion was slight and a pessary worn for six weeks relieved the defect. Vaginitis due to trichomonas dyspareunia the result of extensive repair and formation of scar tissue and menopause discomforts are added complaints.

#### CONCLUSIONS

Vaginal hysterectomy is a valuable aid in the surgical treatment of hysteroptosis.

Malignancy may develop in the cervix and fundus of a prolapsed uterus.

Fourteen slides were shown and the following case report was given:

Mrs. J. J. aged 69 gave a history of five normal deliveries. A growth was removed from the cervix seventeen years ago but the nature of this was undetermined. She had had a watery vaginal discharge for ten or fifteen years and the discharge had been tinged with blood at times for three years. The uterus was completely prolapsed in 1934. The bleeding became profuse in March and April 1935. She entered the hospital in April 1935. The uterus was prolapsed to the third degree. The cervix and the entire anterior and one third of the posterior vaginal wall were involved in a growth which had the appearance of a squamous cell carcinoma. The laboratory report on a biopsy specimen confirmed the diagnosis. At a consultation with the radiologist and surgeons it was decided that the use of x-rays or radium was futile. Vaginal hysterectomy with removal of the involved tissue was advised.

Operation was performed on April 10. With the electric cautery the bladder was separated from the diseased vaginal mucosa. The uterus and its adnexa were removed. Satisfactory new floor to the bladder was made by bringing healthy tissue from the sides of the vagina. The relaxed perineum and rectocele were repaired. The patient left the hospital in thirteen days. Her general condition was markedly improved.

A recurrence of the carcinoma was demonstrated in August and was cauterized with the electric cautery. With the exception of cystitis which has been annoying the patient is in fairly good physical condition.

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# CASE RECORDS of the MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED  
IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

FOUNDED BY RICHARD C CABOT, M.D

TRACY B MALLORY, M.D., *Editor*

CASE 22351

## PRESENTATION OF CASE

*First Admission* A fifty-nine year old white woman was first admitted complaining of shortness of breath and wheezing

For about nine months the patient had mild soreness over the precordium, not accentuated by activity. It was not sufficiently severe to interfere with her activity and except for this she felt perfectly well. Three months before entry she first noted wheezing respirations and dyspnea with the slightest exertion. There was no cough, expectoration, or orthopnea. The patient could lie perfectly flat or sit erect but intermediate positions produced respiratory discomfort. Two months before coming to the hospital she was seized with a sudden sharp stabbing pain in the lateral portion of the left chest. The pain persisted for about twenty minutes and was aggravated by movement and deep inspiration. Thereafter it disappeared completely but recurred at two successive weekly intervals. The attacks occurred at night while in bed and were followed by a slight sensation of soreness in the region involved. During the month prior to entry there were no further attacks of pain but the dyspnea continued unchanged.

Physical examination showed a well-developed, obese woman in no acute discomfort. The heart was normal but the blood pressure in the right arm was 150/90 and in the left 190/100. There was dullness to flatness over the entire left chest anteriorly, most marked in the upper half. In this region the breath sounds were distant, bronchial in character, and tactile fremitus was diminished. Distant pectoriloquy was audible. Posteriorly the left chest was dull to flat from the angle of the scapula downward. Rare crackling râles were heard here and breath sounds and fremitus were diminished in intensity. The remainder of the examination was essentially negative.

The temperature, pulse and respirations were normal.

Examination of the urine was negative. The

blood showed a red cell count of 4,600,000, with a hemoglobin of 80 per cent. The white cell count was 7,750, 71 per cent polymorphonuclears. The stools were negative. A Hinton test was negative. The nonprotein nitrogen of the blood was 27 milligrams per cent.

X-ray examination of the chest showed a large mass, measuring 14 by 9 centimeters, extending out from the mediastinum and almost completely filling the left mid-lung field. The tumor extended from the level of the first rib anteriorly to the fourth interspace. It was rounded in shape with a slightly lobulated lateral border. The lateral view showed the mass lying anteriorly, its anterior margin being flattened against the anterior chest wall. It was intimately related with the shadows of the ascending aorta and pulmonary conus in all views taken but it did not pulsate. There was complete collapse of the left lower lobe with emphysema of the upper lobe and a small amount of fluid at the left base. The heart shadow was slightly displaced to the right but the right lung field was clear. There was no evidence of erosion of the ribs, sternum, or vertebral column. Some films showed a definite outline of the aorta and there was no evident connection with the mass.

There was no change in the patient's general condition and she was discharged on the seventeenth hospital day.

*Second Admission*, twenty-four days later

Following her discharge the patient remained comparatively comfortable. No note of recurrent dyspnea was made.

The physical findings were unchanged except in the chest, where dullness to flatness was elicited anteriorly from the clavicle to the third interspace and posteriorly from the second rib to the fourth interspace. The breath sounds in this region were bronchial in character but distant in intensity. Egophony was audible and vocal resonance considerably increased. The blood pressure readings were now noted as 150/100 in the left and 170/100 in the right arm.

On the third hospital day a chest operation was performed.

## DIFFERENTIAL DIAGNOSIS

DR JOHN D STEWART This pain in the left chest I take to be pleuritic pain, such as might be produced by infection or invasion of the pleura or by tear of an adhesion of some sort.

She has a normal blood picture and there is no evidence of infection there which bears out the normal temperature.

Will you please demonstrate the x-rays at this point, Dr Holmes?

DR GEORGE W HOLMES I think I had better run through several films so you may get

a better idea of the picture. This is the mass on the left side. The absence of a pulsating wall is some evidence against an aneurysm but nothing very definite, although one would expect an aneurysm as large as that to show some pulsation. The lung field is distinctly smaller and although the diaphragm is not clear it does look high, suggesting some interference with the passage of air into that side of the chest. In an oblique view you can see the aorta pretty well. This is the aorta and I think that would almost rule out an aneurysm. Here is a rather better film of the same area. Here is a straight lateral view and in this film the mass is rather better shown and the lobulation spoken of is visible but it is not very striking, rather smooth and sharply outlined. The heart is displaced slightly away from the mass. There is some fluid at the extreme base and definite evidence of interference with air entering that side of the chest. That may be due to pleurisy. It might explain the failure of the lung to expand and there may not be actual obstruction of the bronchus. In the lateral view the posterior part of the lung field is perfectly clear so the mass must be either superimposed on the heart shadow or somewhere in front of the mediastinum.

DR. STEWART: Can you make out the collapse of the lower lobe that is described? Is that a pretty definite thing?

DR. HOLMES: It certainly suggests it. I think this part of the lung is brighter than the opposite side, certainly brighter than this area on the same side. So that there is some compensatory emphysema in that lobe.

DR. STEWART: There is no evidence of involvement of bone. That would be a pretty accurate observation, too?

DR. HOLMES: Yes, I think so. There is no evidence of calcification in the mass itself, which would help a little against the diagnosis of an aneurysm. Here is a film taken a little later. Here is one that shows an increase in the amount of fluid, so that there is now considerable fluid in that side of the chest. From the x-rays we can see that there is a tumor mass lying in the anterior and middle mediastinum in the left upper chest which interferes somewhat with the expansion of the lung on that side. It is accompanied by fluid and there is no evidence of bone erosion and no evidence of calcification in the tumor itself and no visible pulsation.

DR. STEWART: From the x-ray studies we may be fairly certain that the tumor arose outside the lung, or would you go that far?

DR. HOLMES: No, I do not think we can go that far but it is more likely.

DR. STEWART: In considering the differential diagnosis here it seems to me that we can begin considering the non-neoplastic lesions

which might produce a solitary tumor in the chest. Aneurysm is the first thing we might think of, and it has evidently been thought of by the examiners here. So far as the history is concerned aneurysm would be entirely possible. The x-ray would possibly be consistent with aneurysm although, as Dr. Holmes has pointed out, certain things would not fit in, such as the lack of pulsation, the lack of calcification in the wall, and the statement is made, I presume on the basis of fluoroscopic examination particularly, that there is no communication between this mass and the aorta, or at least no evident communication. In addition to that, the physical examination would not support the diagnosis of aneurysm inasmuch as the cardiac examination was negative. This variable pressure in the two brachial arteries I take to be associated with the shifting compression in the mediastinum without direct involvement of the blood vessel. Also the Hinton test is negative. That would be evidence against aneurysm but certainly would not exclude the diagnosis. All in all I think that aneurysm is pretty unlikely here. The bulk of evidence certainly points toward some other diagnosis and I would be influenced particularly by the x-ray finding in which it is stated that the tumor was apart from the aorta.

The second non-neoplastic possibility would be mediastinal abscess. Mediastinal abscesses are pretty uncommon and certainly one of that size would be extraordinarily rare. There is no evidence of general reaction to infection, but such an abscess might be a cold abscess and hence might not produce signs of infection. The sharp border of this mass makes me think it is a tumor and not an inflammatory mass. In addition there is no evidence of erosion of bone or involvement of the neighboring cartilages which one often sees in cold abscess of the mediastinum, so that I would discard this possible diagnosis.

Another possibility, and a very remote one, would be lung abscess and possibly even encapsulated empyema, but those conditions are so unlikely here that I simply mention them in passing. Having rejected the non-neoplastic diagnostic possibilities, let us consider the lesion as neoplastic. Granting that we are dealing with an intrathoracic tumor, we must consider that it might be either inside the lung or outside the lung, and of the possibilities for intrapulmonary neoplasm by far the most common is carcinoma of the lung. The history would be consistent with such a diagnosis in this case, although it would be unusual not to have any sputum with a lesion of this size arising in the bronchial mucosa, and usually there is bloody sputum during the course of development of such a lesion. The diagnosis of bron-

chogenic carcinoma would be supported by an x-ray picture of collapse of the lower lobe and emphysema in the upper lobe. There is trapping of air in the upper lobe in this case, so that part of the x-ray picture is all right. The anteroposterior view would support that diagnosis too, perhaps, although that would be a very large carcinoma of the lung, it seems to me, to have produced symptoms for only three months. The lateral view of the x-ray makes carcinoma of the lung to my mind much less likely because it places the tumor pretty definitely in the anterior mediastinum. So that I will pass by bronchiogenic carcinoma as a diagnosis in this case. Then there is metastatic carcinoma or sarcoma as a possibility. We have no evidence of the presence of any primary lesion and such metastatic lesions in the lung usually are not solitary, and usually involve parts of the lung field which we do not see by x-ray here. They involve the parenchyma of the lung rather than being placed so far anteriorly. Then there is the solitary metastasis to the lung that we occasionally see from a hypernephroma. Such lesions have been taken out on the presumption that there was only one metastatic focus, but we have nothing to suggest that there was a hypernephroma in this case. The urine is noted as being negative. The abdominal examination is negative. There is no evidence of any metastases elsewhere in the abdomen, so that I will pass by also the possibility that this might be a metastatic tumor of the lung.

Then we come to extrapulmonary or mediastinal tumors which might cause this picture. A possibility that we might speak of first is tumor arising in the bones of the chest wall. Such tumors as osteoma, chondroma, osteochondroma or osteosarcoma are not particularly uncommon. About three-fourths of these tumors are malignant and sarcomatous and it is true that they may present chiefly internally rather than externally. I think it would be pretty unlikely to have a tumor arise in the sternum or costochondral junction as large as this without producing some external swelling as well. In addition we have Dr. Holmes's word that the bones of the chest are shown to be uninvolved by x-ray. I think that this possibility we will exclude.

The next possibility to be considered in such a mediastinal lesion is tumor arising in the pleura, such tumors are very uncommon. They may arise from any part of the pleura and they tend to present inwardly rather than externally. They may attain a considerable size. They may be benign or malignant. These tumors are very unusual, however, and I think apart from their rarity we are helped in excluding this diagnosis by the x-ray in which the picture is merely a flattening against the sternum rather

than involvement of a considerable area of the parietal or visceral pleura.

The next possibility I thought of was substernal goiter, and it seems to me that is a very real possibility in this case. I do not see how we can be certain we are not dealing with such a lesion. Substernal goiters may or may not be associated with palpable thyroid tissue in the neck, and the fact that the thyroid was not mentioned on physical examination does not influence us one way or another. Substernal goiters or intrathoracic goiters tend to present internally in the anterior mediastinum, and that apparently is the position of this tumor. This is a very large tumor, however, and just on the basis of its size and unlikelihood I will pass that by as being my first choice, although I do not believe we can exclude it as a diagnosis.

Another possible diagnosis which I will mention only in passing is tumor arising in nerve tissue, such as neurofibroma and ganglioneuroma. Such tumors are much more common in the posterior mediastinum than the anterior mediastinum and they are rare tumors although we have encountered several in this hospital in the past few years. But I do not think I will put that in as first choice although here again we have no way of making sure we have not that lesion to deal with.

Then we come to Hodgkin's disease as a possibility. Pertinent to that diagnosis, the blood picture, what we have of it, is normal. There is no evidence of any involvement of the lymphatic system elsewhere, no palpable lymph nodes in the neck. The shadow of this mass is not suggestive of Hodgkin's disease in my opinion. It has a very sharp outline it appears to be a solitary tumor rather than a cluster of smaller tumors, and it is of very large size without having produced any significant symptoms. However, Hodgkin's disease is certainly a possibility in the diagnosis.

Next for consideration would be a thymoma. That is an ill-defined tumor. Apparently its histology varies, but quite often it is lymphosarcomatous in nature and some believe that lymphosarcomas of the anterior mediastinum almost always arise in the thymus. This is an unusual tumor but there is nothing in the picture here to exclude that as a possibility. Such tumors are usually malignant. I believe and produce more venous obstruction than this tumor has produced. We have no evidence of development of a collateral circulation here. There is no description of venous engorgement in the face and of the upper thorax and presumably no interference with the flow through the superior vena cava. Finally the diagnosis that seems to me most likely is mediastinal dermoid, that term being used to include teratoma. This woman is fifty-seven years old. That is a little bit against the diagnosis because ordinarily

symptoms from the mediastinal dermoid appear earlier in life. Such tumors may be encapsulated and give the round smooth outline that we see in the x-ray here. The position as determined by the lateral x-ray view is consistent with the diagnosis. The absence of evidence of malignancy is somewhat in favor of the diagnosis. And all in all I would put that as my first choice. The three most likely diagnoses in my opinion would be a mediastinal dermoid, a lymphosarcoma possibly arising in the thymus and a substernal goiter.

At this point perhaps we will be permitted a bit of inferential reasoning. We see that the patient was discharged from the hospital and came back twenty-four days later for operation. Now the question is why was she allowed to go out for that period of time? Perhaps she refused operation. On the other hand since we see that her symptoms remained unchanged it is unlikely that she would have come back quite so soon if that were the case. A great help in making a diagnosis of a large mediastinal tumor of this sort is what is called a trial dose of x-ray. We give six to eight hundred R units and within a week if the tumor is lymphoblastoma there will be a diminution in its size and the lesion will go on to practically complete although temporary disappearance. Suppose that she did have a trial dose of x-ray here and she came back and had an operation evidently there was no response to the x-ray. Therefore if we look at it in that way she did not have a lymphoblastomatous tumor. Lymphosarcoma would also respond very well to x-ray treatment and presumably if the lesion did fail to respond to x-ray it was not lymphosarcoma. On the other hand dermoids are not particularly radiosensitive nor of course, is a substernal goiter. Therefore I will say that mediastinal dermoid is my first diagnosis and that a substernal goiter is a more remote possibility.

DR DONALD S. KING: The thoracic service made the same diagnosis that you did Dr Stewart. We thought it was probably a dermoid. We were led to that diagnosis by the same reasoning that you were because it appeared to be in the anterior rather than the posterior mediastinum. We have been seeing a number of chest tumors in the past few weeks and the more we see the more confused we become.

One rule we had that the posterior tumors are neurofibromas and the anterior tumors are dermoids does not always hold as shown by this case and others so we have not even that rule to go on.

#### PREOPERATIVE DIAGNOSIS

Tumor of the mediastinum

DR JOHN D. STEWART'S DIAGNOSIS

Mediastinal dermoid

#### PATHOLOGIC DIAGNOSIS

Neurofibroma of the mediastinum

#### PATHOLOGIC DISCUSSION

DR TRACY B. MALLORY: When Dr Churchill operated on this patient he found that the tumor in spite of the x-ray appearance actually arose in the posterior mediastinum. A relatively long pedicle came out from behind the great vessels and projected anteriorly, so that the inference drawn from the location proved entirely wrong. It was a well encapsulated firm hard mass with a fairly narrow pedicle which it was possible to cut across and the tumor was dissected out without too much difficulty.

Histologically it is a fibromatous tumor. I would personally have a good deal of difficulty in saving positively from the microscopic slides alone that it was of neurogenic origin, but what we know in general about these tumors of the posterior mediastinum makes it extremely probable that it did arise from one of the nerves in that region.

#### CASE 22352

#### PRESENTATION OF CASE

A forty-nine year old practical nurse was admitted complaining of dyspnea and hoarseness.

The patient stated that she had been short of breath for as far back as she could remember. Associated with this dyspnea she frequently noted palpitation and skipped heart beats. About eight months before coming to the hospital she had a series of chest colds associated with a nonproductive cough, malaise, lassitude and hoarseness. The latter was the most persistent symptom. When these acute episodes subsided two months ago she noted that her shortness of breath was rather markedly increased and that the hoarseness continued. The dyspnea was described as inspiratory in character. Five months before entry in the course of an examination she was found to be anemic and given iron therapy. Inhalations for her dysphonia were unavailing. One and a half months prior to admission while learning over a table she first became conscious of a deep dull aching pain in the midsternal region. Subsequently the same sensation was noted over the right lower chest posteriorly, the right mid-scapular region and over the right breast. Lassitude, hoarseness and difficulty in "filling her lungs with enough air" persisted. There was loss of twelve pounds in weight in eight months.

Physical examination showed a well developed and nourished woman in no discomfort. There was dulness to flatness of the right lower chest anteriorly and posteriorly. The breath sounds in the right lower chest posteriorly were di-



minished. No râles were heard. The left diaphragm did not appear to descend so well as the right. No other significant chest signs were elicited and the remainder of the examination was negative. The blood pressure was 140/80.

The temperature, pulse, and respirations were normal.

Examination of the urine was negative. The blood showed a red cell count of 4,400,000, with a hemoglobin of 80 per cent. The white cell count was 10,000, 68 per cent polymorphonuclears. The basal metabolic rate was minus 9.

X-ray examination showed the diaphragm in normal position and exhibited unimpaired respiratory movement. The medial portion of the right lower lung field was occupied by a sharply defined ovoid mass, measuring about 13 centimeters in length and 9 centimeters in width. The lateral view showed the mass to lie anteriorly, immediately behind the anterior chest wall, the depth of the mass being about 8 centimeters. Its margin was slightly lobulated. The lower portion of the mass touched the diaphragm. There were a few areas of calcification in the right hilus but there was no definite evidence of calcification in the mass itself. Fluoroscopy showed no pulsation of the mass, nor were there any changes in its size or shape during respiration. The outline of the right side of the heart was obliterated by the large shadow but the left border showed no variation from the normal. The right lower lung field beyond the mass was slightly less radiant than the opposite side, but the upper lung field was somewhat brighter than the left side. The septum between the upper and middle lobe was slightly displaced downward.

On the third hospital day an operation was performed.

#### DIFFERENTIAL DIAGNOSIS

DR ALFRED KRANES: Will you demonstrate the x rays, Dr Holmes?

DR GEORGE W HOLMES: The outline of the mass as you can see is very sharp. This is thickening a little along the interlobar septum. Certainly there are no calcified masses in the tumor itself. I can see no evidence of erosion of the ribs. The diaphragm moved fairly well as stated in the note. There is no free fluid in the pleural space. The heart is not displaced, neither is the trachea.

DR KRANES: Is there collapse of the middle lobe on the right side?

DR HOLMES: I am not quite certain of the outlines of the middle lobe on the right. There is certainly thickening along the interlobar septum which is difficult to explain.

DR KRANES: The report states that the upper lobe septum was slightly displaced downward. I thought that might signify some collapse of the middle lobe.

DR HOLMES: I would not be at all certain I should think there would be more interference with expansion, if this were an external tumor pressing on the lung root, and in that way causing the collapse. I think that might be a possibility but we have very little evidence, unless we assume that the thickening represents the collapsed lower lobe rather than thickening in the septum itself.

DR KRANES: In other words, we have almost the identical problem here that we had in the previous case, except for the situation of the tumor mass. And I do not know that I can do much more than Dr Stewart has already done in differential diagnosis. He has gone through practically the whole list of tumors that could conceivably give this type of picture. I suppose it would be just as well for me to choose one from that list and hope for the best.

In brief, we have a patient with an eight months' story of respiratory difficulty, dyspnea, hoarseness, cough, pain in the chest, a physical examination which is consistent with atelectasis of the lower portion of the right lung and an x-ray report which says there is a large tumor mass lying anteriorly in the right lower portion of the lung, perhaps causing some atelectasis of the right middle lobe, with downward displacement of the interlobar septum. The discussion therefore boils down to just what the nature of that mass is.

Is it neoplastic and, if so, is it benign or malignant, primary or metastatic? The same problem we had in the last case. Could it be inflammatory, and, if so, just what is the inflammatory agent? Or could it be an aneurysm?

Assuming that the Hinton is negative, and because of the location of that tumor, I should think an aneurysm would be extremely unlikely. It would have to arise from the descending aorta and push itself forward anteriorly, a very unlikely occurrence, so I think we can safely rule out aneurysm. As far as inflammatory diseases go, the absence of chills, fever or leukocytosis, and the involvement of mediastinal structures causing hoarseness almost certainly rule out the more common pyogenic infections such as abscess or encapsulated empyema, and so far as the more chronic granulomatous lesions go, such as tuberculosis and syphilis, I should think they also would be extremely unlikely. Echinococcus cyst could conceivably cause that picture but because of its rarity I am going to forget about it. So that leaves us with the more probable diagnosis that this mass is neoplastic. That is as far as we can safely go. Regarding the nature of the neoplasm, we can only speculate.

There is not very much in the history to make us decide whether it is benign or malignant. I think the x-ray appearance, the very

sharp smooth outline is probably more consistent with a benign than a malignant tumor. The fact that a mass that size if malignant, does not cause more in the way of obvious x-ray signs of collapse is probably against malignancy. On the other hand, in the history we have lassitude, malaise, loss of twelve pounds in weight, and signs of a moderately rapidly growing tumor so that we can put up a fairly good case for both types.

Of the benign tumors in this particular area I think dermoid or teratoma is the most likely possibility as Dr Stewart has already said being in the anterior mediastinum. This one can conceivably have a long pedicle and arise from some other location but it is not very obvious in the x-ray at any rate. I will assume, therefore, that it is in the anterior mediastinum and place dermoid as the first choice. It could also be a neurofibroma. They have been described in the anterior mediastinum but they are relatively uncommon in either place, and much more uncommon in the anterior mediastinum. I think that substernal goiter also has to be definitely considered here, although the situation is very unusual for a substernal thyroid and yet aberrant thyroid tissue has been found in that region. They probably suspected something of the sort when they did a metabolic rate. The fact that it was normal does not influence us one way or the other. Most of them are nontoxic anyway.

Of the malignant tumors carcinoma is by far the most common. If this were malignant it probably would be that, and yet it does not look very invasive, nor does it cause very much in the way of collapse as you would expect if it arose from the bronchus. The other malignant tumors sarcomas and lymphomas are also possibilities but I think quite improbable. There were no other signs of lymphoma such as glandular enlargement, and no mention of a palpable spleen. I should think it would be rather unusual for a lymphoma to cause this particular picture. A sarcoma I think we cannot exclude.

I will guess that it is a benign mediastinal tumor causing pressure on the mediastinum and recurrent laryngeal nerve, producing hoarseness, and probably some pressure on the outside of the right lower or middle lobe bronchus on the right with some atelectasis and that it is probably a mediastinal dermoid with the possibility of substernal thyroid and neurofibroma to be borne in mind.

DR HOLMES: This film was taken after operation and rather confirms Dr Kranes's statement that the middle lobe was collapsed. I think it looks more like collapse than adhesions.

We reviewed these cases in the x-ray room not long ago and reached the same conclusion as Dr King that it is almost impossible to state the nature of the tumor from x-ray examination. We did think we could differentiate infections from tumors. Encapsulated fluid is usually seen in the posterior not the anterior, part of the chest. I do not remember having seen an actual encapsulation in the anterior part. We have missed one or two of the cold abscess type of case but in most of the cases we have been successful in differentiating infections and tumor. When we try to separate the malignant from the benign tumor our success is not great. The benign tumors are less likely to cause interference with the passage of air into the lung, are likely to have pretty sharp outlines and can be shown to grow slowly.

A PHYSICIAN: This patient had cough and inspiratory dyspnea and it is possible that they may have found something by bronchoscopy.

DR. TRACY B. MALLORY: She had been fairly well worked up in another hospital but we have no complete record of their findings. I think it is safe to assume, however, that bronchoscopy was done and was negative and that the Wassermann was negative.

#### PREOPERATIVE DIAGNOSIS

Tumor of the mediastinum

#### DR. ALFRED KRANES'S DIAGNOSES

- 1 Dermoid cyst
- 2 Neurofibroma
- 3 Substernal thyroid

#### PATHOLOGIC DIAGNOSIS

Mediastinal goiter

#### PATHOLOGIC DISCUSSION

DR MALLORY: Dr Churchill found a well encapsulated tumor mass sitting absolutely on the diaphragm and nosing up against the lateral wall of the pericardium. It had a very long pedicle which extended upward as far as he cared to go. He cut across that and resected the tumor which turned out to be a large colloid goiter. I think none of us had ever realized that a goiter could reach the diaphragm.

The discussions of Dr Stewart and Dr Kranes have clearly brought out the fact that the location of a mediastinal tumor is almost the only clue in many instances to its character. How fallible deductions based on this evidence may be is clearly shown by the two cases which have been presented. Each tumor grew from a very long pedicle and neither arose anywhere near the site where it was finally visualized by x-ray examination.

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## PNEUMONIA CONTROL

It is with no desire to be unfriendly nor are we lacking in high regard when we permit ourselves to wonder if one of our most distinguished neighbors has not been unmindful of the notable achievement of Massachusetts in initiating and carrying to successful completion a movement directed to the control of lobar pneumonia.

In the July twentieth issue of the esteemed *Health News* of the New York State Department of Health we were somewhat amazed to read an abstract of an address given at the Annual Conference of Health Officers and Public Health Nurses at Saratoga Springs, June 23, 1936. The final paragraph of the abstract reads as follows:

"The New York State pneumonia control program seems to me unique since it represents a co-operative effort participated in by the medical and nursing professions, public health officials, and laboratory staffs all working toward a common end—the reduction of mortality from pneumonia. It is to be hoped that we can look

upon this program as a turning point in the struggle to overcome diseases of the respiratory tract just as we can look back upon accomplishments in preventing acute intestinal infection."

From all that we have learned the purpose of the New York effort has much to commend it, and with its eminent leaders and generous financial support it should justify its present promise. However, we are wholly unable to grant that the New York program is in any way unique or that it may be looked upon as a turning point in the struggle to overcome diseases of the respiratory tract. The word and the phrase are more accurately descriptive of the Massachusetts Pneumonia Study and Service which last December completed its fifth year of existence.

We have had frequent occasion to record on our pages the aims, plan, progress and accomplishments of the Massachusetts program, and we have been so deeply impressed by the originality and thoroughness of the study and of the benefits accruing from the endeavor that we expressed our appreciation in our issue of March 5, 1936, page 489.

We confess that we are jealous—and we think justly so—of the foresight, the intelligence, the enterprise, and the success of our State Public Health Officers in presenting to other states an example of a sound method for studying and controlling lobar pneumonia. The example is being followed in more or less modified form by Connecticut, Maine, Michigan, and now New York.

As in so many projects designed for the common weal, Massachusetts can be rightly looked upon as the pioneer in an organized attempt to bring pneumonia under control. We wish New York and the other states all success in their undertaking, but we stoutly maintain that any laurels for the conception and prior operation of such a program belong to Massachusetts.

## THE DISTRIBUTION OF MEDICAL SERVICE IN MASSACHUSETTS

THE fourteenth edition of the American Medical Directory accounts for 165,163 physicians in the United States. This is roughly one physician for each 700 people throughout the country. Among the New England States four have more people per doctor and two have less than this figure for the country as a whole. Specifically, Maine has 832, New Hampshire has 793, Rhode Island has 763, Vermont has 717, Connecticut has 688 and Massachusetts has 597 people to support each physician. Only ten years ago there were approximately 670 people for each doctor in Massachusetts, there having been an increase of 17 per cent in the number of doctors with an increase of less than 5 per cent in the population as a whole during the past decade.

In spite of the present crowding of physicians in the State the towns of less than 5 000 population still provide 406 168 people for 370 physicians—a ratio of one physician for each 1098 people. On pages 412-418 of this issue the *Journal* presents a survey of these Massachusetts towns. Eighty-four of them, with a total population of 80 399 are without doctors. Of the 370 physicians in the one hundred and forty-eight remaining towns 109 are less than forty years old 136 are between forty and sixty and 125 are over sixty years of age.

Of course the eighty-four towns without doctors are not without medical service many of them are conveniently adjacent to communities which are well supplied with doctors, all of them are probably on roads which are passable for automobiles throughout the year. Most of them would nevertheless welcome a well-trained doctor of their own. More than half of them are over 500 population and nearly one third of them are over 1000. There is one town of more than 4000 in which there is apparently no resident physician. There are nineteen towns of more than 2 000 with but one resident physician. Whether the openings which are here suggested are merely paper opportunities can only be determined by individual investigation. Many of them must be real.

We do not wish to wax emotional about the good old days nor need we rehearse a comparison of city with rural life, these are largely expressions of temperament. It is plain that the doctor in the town of less than 5 000 has twice as many people to care for. They need but pay him half as much to allow him the income of his brother in the city. He may have to work twice as hard to earn it but he knows full well that there is economic opportunity if not gold, in "them hills." He may also be cheered to know that city dwellers statistically lead shorter lives and more frequently must call upon charity to eke out their incomes.

Why if these things are so, do those of us who perennially complain about "collections" stay in the city? For years we have crowded ourselves under the influence of cultural and educational opportunity. It is altogether appropriate that cultural and educational agencies should now encourage a return to those places where we are needed and presumably wanted. For six years Tufts College Medical School with the aid of the Commonwealth Fund of New York has been providing liberal fellowships for undergraduates who will agree after school and hospital graduation to practice in the country for a period of at least three years. The chances appear to be good that economic forces will tempt them to stay for longer periods.

## THE UNDERWRITERS BUREAU

DR BEGG Secretary of the Massachusetts Medical Society has been appealed to for information respecting The Underwriters Bureau with headquarters in Kansas City.

According to statements submitted by the doctors who have been interviewed by representatives of the Underwriters Bureau the plan is to collect fifteen dollars covering a two years period from two doctors in a given city and in return for this payment the names of the two contributing doctors will be listed in a publication and subject to call for examinations of automobile accident cases or other indemnities. The name of the solicitor in one instance is T B Leeper. The Boston Better Business Bureau reports that the Underwriters Bureau is a trade name used by J N Joerger and Martin Coughlin Jr co-partners. These men state according to the Boston Better Business Bureau that the trade name has been registered with the Missouri Secretary of State. In 1935 the subject published its first legal directory containing the names of attorneys their addresses references and so forth. This directory according to the Underwriters Bureau was mailed to the home offices of 2 000 insurance companies. The directories were sent to the insurance companies unsolicited without charge.

In 1935 the subject also compiled the first edition of a medical directory which was sent unsolicited to life health accident and indemnity insurance companies.

We are informed a charge of \$15 is made to attorneys and physicians for listings. The subject states it does not guarantee that any benefit will accrue to the person whose name is listed in the directory. According to the company each person paying for a listing will be furnished a printer's proof of his individual listing, but will not receive a copy of the directory. The Bureau is now soliciting listings for 1936 editions of medical and legal directories.

The legal directory to date has not been approved by the Advisory Committee of the Missouri Bar.

Information from other sources tends to indicate that this movement is widespread and doctors in many places have been interviewed by these solicitors.

It is difficult to estimate the value of the contribution of fifteen dollars for this purpose by doctors. Certainly any physician of standing would want to know with whom he is to be associated in making reports of examinations.

The information available thus far does not warrant the expression of an opinion which will be of any value to physicians. We do not see that there is any assurance of financial benefit resulting from this form of advertising.

## CANCER STUDIES

IN RELATION TO RESULTS OF TREATMENT WITH  
AN AQUEOUS EXTRACT MADE FROM THE  
CORTEX OF THE SUPRARENAL GLAND

A TRIBUTE to the innate common sense and conservatism of the medical profession is seen in the quiet disregard of the recent article by Coffey and Humber<sup>1</sup> summarizing their own evaluation of their recently widely publicized adrenal cortical treatment for cancer.

This report is based on 7513 cases, supposedly of inoperable and hopeless malignant disease. The authors state that at least thirty injections of the extract are needed before any beneficial results can be expected, although pain may be relieved earlier in many cases. The requisite number of injections were received by 1040 cases. Of these, 10.5 per cent are alive five years after being admitted to the clinics, and 51 per cent alive five years without clinical evidence of malignancy. From the natural course of the disease in cases which have had previous treatment of orthodox type, as had many of these cases, not dissimilar results may be expected with merely supportive treatment.

It is significant that the best results with the treatment were obtained from the psychological angle. The authors state that 75.5 per cent had improved sense of well-being and 65.3 per cent had their pain greatly relieved.

The data presented do not impress the reader that an important contribution to cancer therapy has been made.

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CONTAINS articles by the following named authors:

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SMITH, DAVID T. A. B., M. D. Johns Hopkins University School of Medicine 1922. Assistant in Pathology and Bacteriology, Rockefeller Institute, 1923-1924. Bacteriologist, Pathologist and Director, Research Laboratory of New York State Hospital for Tuberculosis, Ray Brook, New York, 1924-1930. Bacteriologist and Associate Physician, Duke Hospital, 1930. Address: Duke Hospital, Durham, N. C. Then subject is: Successful Treatment of Brucella Meningitis with Immune Human Serum. Isolation of the Organism by a Modified Cultural Method. Page 369.

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GONZALES, THOMAS A. M. D. Bellevue Hospital Medical College 1898. Acting Chief Medical Examiner, New York City. His subject is: The Needs for Improvement in Medicolegal Investigations. Page 385. Address: 56 E. 8th Street, New York City.

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## MISCELLANY

## CONNECTICUT NEWS

## THE WASSERMAN TEST AND MARRIAGES

Since Connecticut's law requiring blood tests before marriage went into effect last January, weddings in the state have dropped to approximately half the number that there were before.

The State Department of Health figures show that during the first five months of the year from January through May 1813 marriages were performed in Connecticut. In the same five months of 1935 there were 3,468 couples wed. This is a drop of more than 47 per cent.

The marriage law requires both the man and woman applying for a marriage license to present a doctor's certificate showing that the applicant has submitted to a blood test for syphilis and that the reaction has been negative. The specimens of blood may be examined in any laboratory approved for that type of work by the Health Department, and

only a part of the specimens go to the department's own laboratory in Hartford.

The sharpest decline in marriages has been in the border towns indicating that fewer people are coming into Connecticut from other states to marry. The Health Department has no figures yet to indicate how many Connecticut people are going outside the state to marry this year. Information from other states will be secured after the law has been in effect longer.

#### CHANGES IN HARTFORD'S BOARD OF HEALTH

Dr. George E. Cogan, vice president of the Board of Health of Hartford, was recently elected president to succeed Dr. Robert V. Boyce who resigned July 1. Dr. Cogan has been a practicing physician in Hartford for ten years, specializing in gynecology. He is attending gynecologist and associate obstetrician on the staff at St. Francis Hospital. He graduated from Georgetown University with a bachelor of science degree, and received his doctor of medicine degree at the same university. He served as interne at Columbia Hospital for Women and Georgetown University Hospital in Washington, D. C., at Bellevue Dispensary in New York, and at St. Francis Hospital, Hartford. Dr. Cogan is a Fellow of the American College of Surgeons and a diplomate of the American Board of Obstetrics and Gynecology.

To fill the vacancy on the Board of Health produced by the resignation of Dr. Boyce, Mayor Spelacy has appointed Dr. Charles W. Daly, a practicing physician in Hartford for more than twenty-five years. Dr. Daly was born in Hartford in 1883 and attended the St. Joseph's School and the Hartford Public High School. He received his medical degree from the University of Maryland in 1910 and then served as interne at St. Francis Hospital, Hartford, until 1919 when he took up graduate work in internal medicine at Bellevue Hospital, New York, and at the New York Post-Graduate Hospital. Dr. Daly is well known as an amateur horticulturist, having a large flower garden at his home.

Dr. Samuel Green, health officer of Southbury, has presented the Hartford Board of Health with the certificate issued by the Common Council in 1878 appointing his father, the late Dr. George S. Green, a member of the Hartford Board of Health.

#### SOCIAL SERVICE COSTS IN HARTFORD

According to the Federal Census Bureau, the per capita welfare cost in Hartford is about three times as great as in the average city of 100,000 to 300,000 population class. The bureau found expenditures for such work in Hartford aggregated \$1,849,278 in 1934, or an average of \$10.97 per resident. Only three cities surpassed Hartford in per capita outlay: Syracuse with an average of \$14.01, Bridgeport with \$12.82, and Yonkers with \$12.00 per resident. This cost represented in Hartford an increase from \$1.60 in 1926 to \$10.97 in 1934. The Social Security Board

must catalogue every worker in the state eligible to participate in the Federal Social Security program.

#### ACCIDENTAL DEATHS

During the year 1935 there were 17,355 deaths in Connecticut due to all causes. This total includes 1,255 deaths due to accident in some form, or 7.2 per cent of the total mortality.

Deaths due to occupation make up only 4.4 per cent of the total deaths; home accidents account for 27.9 per cent; motor vehicle accidents contribute 39.2 per cent of all deaths due to accidents in public places appear in 28.5 per cent, of all accidental deaths. Accidental deaths therefore, due to automobile accidents contributed substantially more than any other classification.

Analyzing the various classes of all accidents which occur in the home falls account for 67 per cent or two-thirds. Conflagration, burns and explosions contribute about 15 per cent of all the accidental deaths occurring in the home. Motor vehicles appear in 49.1 accidental deaths. Of this total 55.8 per cent were pedestrians. The next largest group is collision with other motor vehicles and this accounts for about 17 per cent of all motor accidents. The astonishing total of 274 pedestrians met their death in collision with a motor vehicle.

Annually the list of accidental deaths will include some familiar causes. In 1935 no less than five persons met death from accident by smoking in bed.

#### SEWAGE TREATMENT IN CONNECTICUT

It is gratifying to record the progress Connecticut municipalities are making in cleaning up Connecticut's waters. At the same time there are some large sources of pollution that should be eliminated.

The four largest communities in the state are Hartford, New Haven, Bridgeport and Waterbury. The Hartford Metropolitan District now has under construction a new sewage treatment plant which provides for sedimentation of the sewage of the district before discharge into the Connecticut River except at high river stages when large dilution is available. This plant and various intercepting sewers will cost approximately \$3,500,000. New Haven has constructed a sedimentation and chlorination plant for the East Street district which is estimated to treat about 40 per cent of the city's sewage but the city is still faced with the problem of treating the sewage for the remainder of the city in order to clean up polluted New Haven Harbor. Bridgeport has built two sewage screening plants at Bostwick Avenue and Congress Street which help to relieve local nuisance conditions in the vicinity of these outlets but which do little to remove the pollution load upon Bridgeport Harbor. Bridgeport is now undertaking a preliminary survey to determine feasible and economical methods of meeting the city's sewage disposal problem which it is hoped will produce results. The city of Water

bury discharges its sewage into the Naugatuck River without treatment although progress has been made of late in the building of trunk sewers in the city which further the sewerage program. New Britain, fifth city in the state, is now constructing a chemical precipitation plant for the treatment of its sewage before discharge into the Mattabesset River, a relatively small tributary of the Connecticut. Stamford, the next largest city, has a sedimentation and chlorination plant which is in some need of enlargement.

Of the smaller cities, Meriden has a large sand filter plant in need of modernization and enlargement to handle high flows. Norwalk has a screening sedimentation and chlorination plant which does an effective job of treatment in protecting the bathing and shellfish areas. Greenwich has four satisfactorily operated sewage treatment plants, one of which is in need of enlargement. Norwich is now constructing a plant to serve one portion of the city. New London has an effectively operating sedimentation and chlorination plant for one small section of the city but still has work before it to improve sewage disposal conditions along the shore. Bristol has a satisfactorily functioning sand filter plant and Danbury is now enlarging and improving its disposal plant to provide trickling filter treatment for the screened and settled sewage. The plant has been extended considerably in the recent past in addition to the present construction. Torrington is now constructing a sedimentation plant. West Haven has finally completed plans for rebuilding the Blohm Street plant with new sedimentation tanks, seasonal chemical precipitation and chlorination and it is expected that this work will go forward this year. A force main is now being constructed to eliminate the sewage discharge at the Prospect Beach plant and bring it to Blohm Street. West Hartford's sewage is discharged into the Hartford system where treatment is being provided. Middletown is now constructing a sewage treatment plant of the sedimentation type. Manchester has in the south part of the town a sedimentation plant somewhat in need of enlargement and the plants in the north part of Manchester need to be replaced by a modern treatment plant.

In communities below the 20,000 population class, there is a considerable number of public sewage treatment plants, notably in Canaan, Lakeville, Litchfield, New Canaan, Norfolk, Ridgefield, Rockville, Southington, Stratford, Wallingford and Waretown. Most of these plants do an effective job of treatment. Sewage disposal along the shore is especially important because of bathing areas and shellfish grounds. It is not a satisfactory situation when we consider that among the larger shore cities and towns only Norwalk and Greenwich are in a good position. Stamford and Stratford are not in the worst category but need improvements. West Haven and Milford are making progress. Bridgeport and New Haven are major pollution offenders with several other small communities needing bet-

terments. It is pleasing to record that a commission recently organized in the Bridgeport area is studying the pollution abatement problem and it is hoped that the long looked for improvement in this area will shortly go forward. The shore communities should become alive to the situation and conserve their bathing and shellfish areas. Outstanding among the large interstate rivers where sewage treatment plants are under way is the Connecticut River. East Hartford represents the sole remaining large community along the river where a large volume is discharged without any corrective measures under way although Windsor, Windsor Locks and two or three other small communities discharge some pollution into the river in Connecticut. On the immediate tributaries such as the Hockanum River, Manchester settles most of its sewage and Rockville sewage is settled. A great deal of pollution reaches the Connecticut River in the northerly states notably Massachusetts. It is hoped that progress may be made by means of interstate compacts to reduce the river pollution outside of the state limits. In Connecticut and the states to the north commissions have been appointed to consider pollution abatement measures on an interstate scale.

Bridgeport and New Haven are striking examples of large scale serious pollution sources needing correction to protect bathing beaches and conserve shellfish areas. Several other shore communities need sewage treatment facilities, as mentioned. Greenwich and Norwalk, with the shortly expected addition of Milford and West Haven are pointing the way to desirable accomplishments.

Torrington is setting an example for the downstream communities along the Naugatuck River and the Housatonic River near the junction of the two rivers including Thomaston, Waterbury, Naugatuck, Seymour, Derby, Shelton and Ansonia. Putnam and Norwich are cases of progress in eastern Connecticut. Interstate river pollution correction studies are under way. Substantial progress is being made on the Connecticut River watershed in Connecticut. Public support is needed to force the installation of necessary additional sewage treatment plants and also to provide the necessary funds and qualified personnel to operate these plants effectively. The protection of our bathing beaches, shellfish areas and possible future water supply streams, the avoidance of nuisance conditions and the conservation of our natural resources, all demand this. City governments naturally reluctant to undertake expenditures for new undertakings even when for the public good can be heartened to do so with encouragement from the public.

#### CONNECTICUT STATE CANCER PROGRAM

A plan for organization of a Connecticut State Cancer Program has been adopted by the State Medical Society working in conjunction with the State Department of Health. The various ramifications of this plan can be briefly defined as follows:



The State Medical Society yearly appoints a State Tumor Committee whose duties are the following

To study the cancer problem in the State of Connecticut

To combat the disease with the most up-to-date methods available

To accomplish this, the State Tumor Committee has in turn appointed two active Committees namely, a Publicity Committee and a Scientific Committee. The duties of the Publicity Committee are as follows

1 To educate the public that cancer is curable if adequately treated in its early stages

2 To educate the doctors to the necessity of making a complete and thorough physical examination

3 To preach the value of periodic examinations to the public

4 To draw up a list of speakers who would be available for addresses before lay and medical organizations

5 To write articles for the education of the public and doctors

The functions of the Scientific Committee are the following

1 To keep the doctors well informed as to the most up-to-date methods of curing and combating malignant disease

### COMPARISON OF DISEASE INCIDENCE IN CONNECTICUT WITH 1935 AND SEVEN YEAR AVERAGE

MONTH ENDING AUGUST 15, 1936

Diseases	1936				Average cases reported for week corresponding to Aug 15 for past seven years	1935			
	Week ending July 25	Week ending Aug 1	Week ending Aug 8	Week ending Aug 15		Week ending July 27	Week ending Aug 3	Week ending Aug 10	Week ending Aug 17
Amebiasis	—	1	—	—	—	—	—	—	—
Chickenpox	11	16	12	6	8	22	10	3	8
Conjunctivitis Infectious	—	—	—	—	—	1	—	—	—
Diphtheria	—	1	1	1	7	9	2	2	4
Dysentery Bacillary	—	—	—	1	—	2	1	1	2
Encephalitis Epidemic	1	—	—	—	—	—	—	—	1
German Measles	15	11	7	3	—	14	5	5	9
Influenza	—	—	1	—	1	—	1	—	—
Malaria	—	—	—	—	—	—	—	—	1
Measles	32	14	16	10	26	68	35	26	15
Meningococcus Meningitis	—	—	3	—	—	1	1	—	1
Mumps	26	19	12	20	7	13	14	9	7
Paratyphoid Fever	1	—	—	—	—	—	1	12	5
Pneumonia (Broncho)	8	6	5	8	6	8	10	6	3
Pneumonia (Lobar)	17	5	12	9	5	4	5	4	3
Poliomyelitis	1	—	1	1	11	5	10	22	43
Scarlet Fever	7	9	8	8	9	15	8	11	8
Streptococcus Sore Throat	1	2	3	—	—	1	—	—	4
Tetanus	—	—	—	—	—	1	1	1	—
Trachoma	—	—	—	—	—	1	—	—	—
Trichinosis	—	1	—	—	—	2	—	—	—
Tuberculosis (Pul)	33	24	24	17	30	17	29	38	20
Tuberculosis (O F)	4	1	2	1	3	3	2	3	1
Typhoid Fever	3	—	1	2	3	2	—	1	5
Undulant Fever	4	2	1	2	—	—	1	2	—
Whooping Cough	67	58	76	51	35	42	51	45	35
Gonorrhea	13	62	29	27	41	50	37	17	21
Syphilis	14	85	44	39	38	56	53	32	23

Remarks No cases of Asiatic cholera, glanders, plague or yellow fever during the past seven years

2 To see that Tumor Clinics already established in the State, are kept up to a high standard

3 To help other hospitals throughout the State to establish Tumor Clinics

4 To suggest other plans of operation which might help in furthering the program

The Scientific Committee has been instrumental in forming the Association of Connecticut Tumor Clinics. This Association is a separate organization, but the Chairman and Secretary are the Chairman and Secretary of the State Tumor Committee. The Association has appointed Committees on Therapy, Pathology and Records for the following purposes

1 To exchange ideas

2 To standardize clinic records throughout the State

3 To clarify pathological nomenclature

4 To consider problems concerning therapy treatment of cancer

The State Department of Health by act of the Legislature, has recently become a co-ordinating unit in this plan of organization. Functioning through the Bureau of Preventable Diseases are three major activities which may be defined as statistical analyses of cancer mortality tabulation and analysis of cancer clinic records and public education. This work is closely related to and dependent upon various activities of the State Tumor Committee. Acting as an integral unit much has already been accomplished in spite of the fact that the broader aspects of this problem are sufficiently complex to warrant slow and gradual development.

#### COMMITTEE ON PUBLIC HEALTH CONNECTICUT STATE MEDICAL SOCIETY

At the second session of the House of Delegates during the 144th Annual Meeting of the Connecticut State Medical Society, May 21, 1936, the following members were elected to serve on the Public Health Committee

Joseph I Linde, M.D., New Haven Chairman (Pediatrics)

Louis M Allyn M.D., Mystic

Howard W Brayton, M.D. Hartford (Pediatrics)

Ernest J Caulfield, M.D., Hartford

A. Newell Creadick, M.D., New Haven (Obstetrics and Gynecology)

John S Dye, M.D., Waterbury

Joseph H Howard, M.D., Bridgeport (Obstetrics and Gynecology)

Louis O LaBella, M.D., Middletown

James R. Miller, M.D., Hartford (Obstetrics and Gynecology)

Oliver L Stringfield, M.D., Stamford (Pediatrics)

W Bradford Walker, M.D., Cornwall

At this meeting, the Council recommended, in accordance with those recommendations contained in Report of the Committee on Public Health, that the House of Delegates, in the name of the Connecticut State Medical Society, shall hereby record its approval of and recommend procedure in accordance with the Act of the 1935 Legislature (Section 929c Cumulative Supplement to the General Statutes, January Sessions, 1931, 1933, 1935, State of Connecticut), whereby Sanitary Districts with full time medical Health Officers may be formed, and further shall direct that a copy of this approval and recommendation be transmitted to the State Commissioner of Health for use in efforts to secure the formation of such Sanitary Districts.

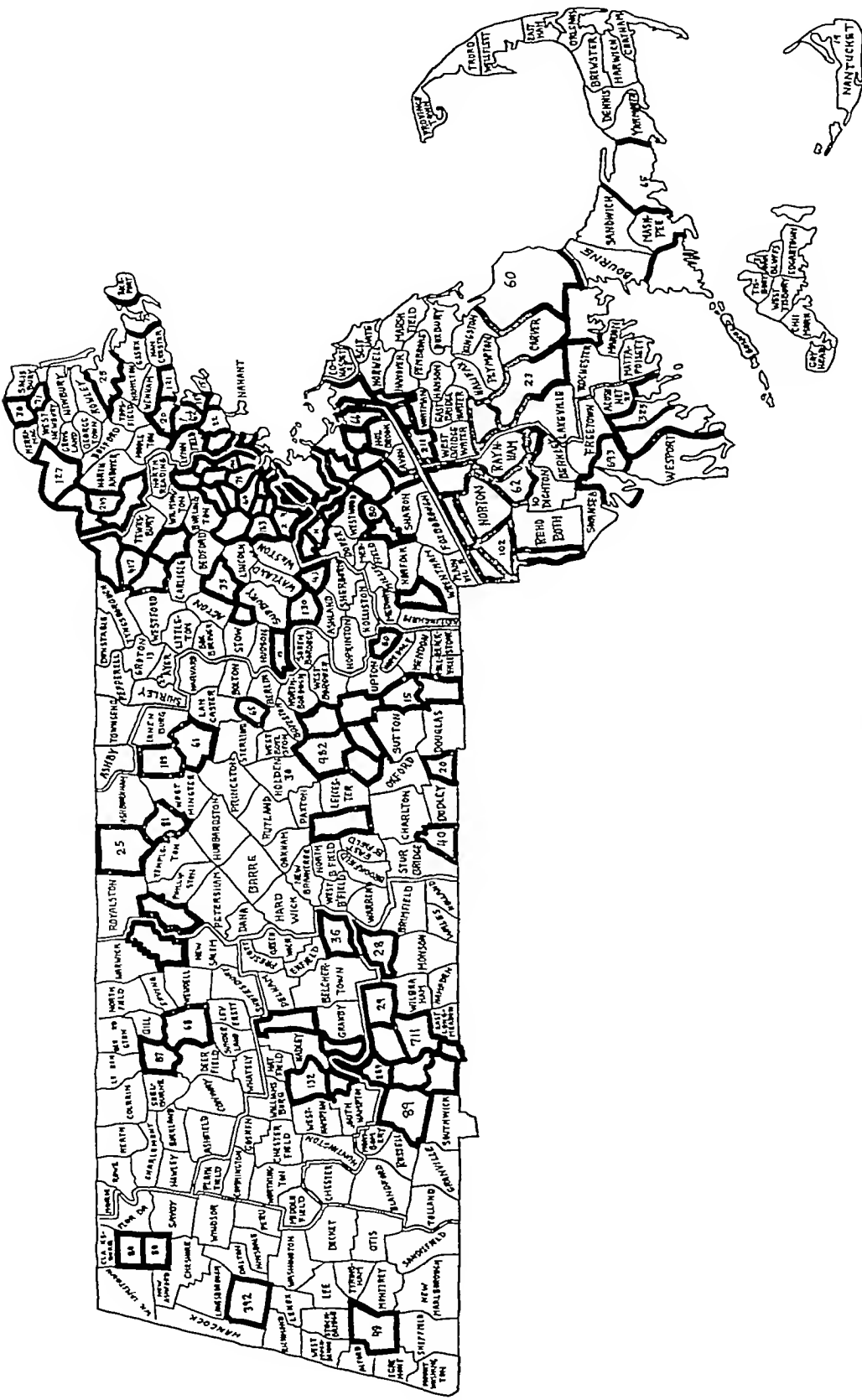
The House of Delegates voted to adopt this recommendation of the Council and thereby in the name of the Connecticut State Medical Society, voted to record approval of and to recommend procedure under the Sanitary Districts law, and to approve still further this action and recommendation by the State Department of Health.

#### THE DISTRIBUTION OF DOCTORS IN SMALLER COMMUNITIES OF MASSACHUSETTS

In the following table there are listed, by counties the townships in Massachusetts of less than 5,000 population, according to the 1935 Decennial Census of the Commonwealth. With each township there are also listed the number of people per doctor, and the number of doctors, by ages according to the fourteenth edition of the *American Medical Directory* published in June, 1936. This material is intended to provide information concerning the distribution of doctors in the smaller communities of Massachusetts, and it is hoped that it may be of assistance in the selection of locations within the Commonwealth for younger men.

Doctors were not included in the table when data were available that they were either retired or not in practice, or when the tabulator knew that certain doctors were not in practice in the towns in which they were listed as residents. Of course the tabulator was aware of such local situations in comparatively few instances and there are doubtless a considerable number of inaccuracies which our sources of information cannot correct at the present time. In certain townships (marked with an asterisk \*) the figures for both the population and the number of doctors have been corrected to exclude those resident in institutions situated within the town lines. Figures are thus produced which more accurately suggest what the local supply and demand for medical service might be.

The assistance of the several District Medical Societies is solicited in the correction of these figures whenever changes take place. Reports should be sent to *The New England Journal of Medicine* promptly.



MASSACHUSETTS TOWNS OF LESS THAN 5,000  
POPULATION  
Numbers Indicate Beds in General Hospitals Registered  
by American Medical Association  
Towns of more than 5,000 are bounded by heavy  
lines Towns under 5,000 are bounded by narrow  
lines Counties are bounded by double lines

	Population by 1935 Census	No of People per Doctor	Doctors by Age		
			Under 40	40-60	Over 60
<i>Barnstable County</i>					
Bourne	3,336	477	3	2	2
Brewster	715	715	—	—	1
Chatham	2 050	682	2	—	1
Dennis	2 017	671	—	2	1
Eastham	606	—	—	—	—
Harwich	2,373	382	1	3	2
Mashpee	380	380	1	—	—
Orleans	1 425	285	1	2	2
Provincetown	4 071	809	—	3	2
Sandwich	1,516	758	—	1	1
Truro	541	—	—	—	—
Wellfleet	948	474	—	1	1
Yarmouth	2 095	1 047	—	1	1
Total	22,073	Average 596	Total 8	15	14
<i>Berkshire County</i>					
Alford	210	—	—	—	—
Becket	723	—	—	—	—
Cheshire	1,660	1,660	—	1	—
Clarksburg	1,333	—	—	—	—
Dalton	4,282	1,427	1	—	2
Egremont	569	—	—	—	—
Florida	405	—	—	—	—
Hancock	408	—	—	—	—
Hinsdale	1,144	572	1	1	—
Lanesborough	1 237	—	—	—	—
Lee	4 178	696	2	4	—
Lenox	2,706	1,353	1	1	—
Monterey	325	—	—	—	—
Mount Washington	64	—	—	—	—
New Ashford	94	—	—	—	—
New Marlboro	921	921	—	1	—
Otis	415	207	2	—	—
Peru	151	—	—	—	—
Richmond	628	—	—	—	—
Sandisfield	471	—	—	—	—
Savoy	299	299	1	—	—
Sheffield	1 810	—	—	—	—
Stockbridge*	1,871	624	3	—	—
Tyringham	243	—	—	—	—
Washington	252	—	—	—	—
West Stockbridge	1 138	569	1	1	—
Williamstown	4 272	534	3	3	2
Windsor	412	—	—	—	—
Total	32 221	Average 1 039	Total 15	12	4
<i>Bristol County</i>					
Acushnet	3 951	—	—	—	—
Berkley	1 156	—	—	—	—
Dighton	3 116	3 116	1	—	—
Freetown	1 813	1 813	—	—	1
Norton	2 925	1 462	2	—	—
Raynham	2 208	—	—	—	—
Rehoboth	2 777	2 777	1	—	—
Swansea	4 327	1 442	—	1	2
Westnort	4 355	2 177	—	2	—
Total	26 628	Average 2,663	Total 4	3	3

*Dukes County*

Chilmark	253	—	—	—	—
Edgartown	1 399	466	1	2	—
Gavhead	158	—	—	—	—
Gosnold	129	—	—	—	—
Oak Bluffs	1 657	828	2	—	—
Tisbury	1 822	364	1	4	—
West Tisbury	282	282	—	1	—
Total	5 700	Average 518	Total 4	7	—

*Essex County*

Boxford	726	726	1	—	—
Essex	1 486	372	1	2	1
Georgetown	2 009	502	1	1	2
Groveland	2 219	2 219	—	1	—
Hamilton	2 235	554	1	2	1
Lynnfield	1 896	—	—	—	—
Manchester	2 509	502	2	3	—
Merrimac	2 209	736	1	1	1
Middleton*	1 615	1 615	1	—	—
Nahant	1 748	581	1	2	—
Newbury	1 576	—	—	—	—
Rockport	3 634	727	—	3	2
Rowley	1 495	1 495	—	1	—
Salisbury	2 245	—	—	—	—
Topsfield	1 113	556	—	—	2
Wenham	1 196	1 196	—	1	—
West Newbury	1 475	1 475	—	1	—
Total	31 386	Average 872	Total 9	18	9

*Franklin County*

Ashfield	918	918	—	1	—
Bernardston	975	—	—	—	—
Buckland	1 540	385	2	1	1
Charlemont	923	923	—	1	—
Colrain	1 554	1 554	—	—	1
Conway	952	952	1	—	—
Deerfield	2 963	741	3	1	—
Erving	1 283	1 283	1	—	—
Gill	995	—	—	—	—
Hawley	308	—	—	—	—
Heath	368	—	—	—	—
Leverett	726	—	—	—	—
Levden	253	—	—	—	—
Monroe	240	—	—	—	—
New Salem	443	—	—	—	—
Northfield	1 950	390	4	1	—
Rowe	277	—	—	—	—
Shelburne	1 606	—	—	—	—
Shutesbury	239	—	—	—	—
Sunderland	1 182	1 182	—	1	—
Warwick	565	282	1	—	1
Wendell	397	—	—	—	—
Whately	1 133	—	—	—	—
Total	21 790	Average 1 037	Total 12	6	3

*Hampden County*

Blandford	469	—	—	—	—
Brimfield	892	892	—	—	1
Chester	1 362	1,362	1	—	—
East Longmeadow	3 375	—	—	—	—
Granville	704	704	—	—	1
Hampden	854	—	—	—	—
Holland	201	—	—	—	—
Monson*	3,719	1,239	1	1	1
Montgomery	174	—	—	—	—
Russell	1 283	1,283	1	—	—
Southwick	1,540	1,540	1	—	—
Tolland	141	—	—	—	—
Wales	382	382	—	—	1
Wilbraham	2,969	1,484	1	—	1
Total	18 065	Average 1,642	Total 5	1	5

*Hampshire County*

Belchertown*	2,553	2,553	—	1	—
Chesterfield	445	445	1	—	—
Cummington	610	610	—	1	—
Enfield	495	495	—	—	1
Goshen	257	—	—	—	—
Granby	956	—	—	—	—
Greenwich	219	—	—	—	—
Hadley	2,711	1,355	—	1	1
Hatfield	2,433	811	1	—	2
Huntington	1,345	672	2	—	—
Middlefield	220	220	—	1	—
Pelham	504	—	—	—	—
Plainfield	332	—	—	—	—
Prescott	18	—	—	—	—
Southampton	954	—	—	—	—
Westhampton	405	—	—	—	—
Williamsburg	1 859	372	1	4	—
Worthington	530	530	—	—	1
Total	16,846	Average 936	Total 5	8	5

*Middlesex County*

Acton	2,635	527	—	1	4
Ashby	957	—	—	—	—
Ashland	2 497	2,497	—	1	—
Ayer	3 861	643	2	2	2
Bedford*	2,345	2,345	1	—	—
Boxborough	404	—	—	—	—
Burlington	2,146	—	—	—	—
Carlisle	688	688	—	1	—
Dunstable	419	—	—	—	—
Groton	2,534	845	1	2	—
Holliston	2 925	585	1	3	1
Hopkinton	2 616	1,308	—	1	1
Lincoln	1 573	231	—	3	3
Littleton	1 530	510	1	2	—
North Reading*	2 051	2 051	1	—	—
Pepperell	3,004	1,001	—	—	3
Sherborn	994	—	—	—	—
Shirley	2 548	2 548	1	—	—
Stow	1 190	—	—	—	—
Sudbury	1 638	1 638	—	1	—
Tewksbury*	3 136	—	—	—	—

*Middlesex County (Continued)*

Townsend	1,942	588	—	—	3
Tyngsboro	1 331	1,331	—	1	—
Wavland	3 346	836	1	—	—
Westford	3 789	1,263	—	3	—
Weston	3 848	641	1	2	—
Wilmington	4 493	2 246	2	—	—
<hr/>					
Total	60 440	Average 1 162	Total 12	23	17

*Nantucket County*

Nantucket	3 495	Average 699	Total 2	3	—
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*Norfolk County*

Avon	2 362	2,362	—	—	1
Bellingham	3 056	—	—	—	—
Cohasset	3 418	1,139	1	2	—
Dover	1 305	—	—	—	—
Foxborough*	4 557	759	—	2	4
Holbrook	3 364	1 682	—	1	1
Medfield*	2 326	775	2	—	1
Medway	3 268	817	3	—	1
Millis	2 098	2 098	1	—	—
Norfolk*	1 222	—	—	—	—
Plainville	1 606	1 606	—	—	1
Sharon*	3 683	1 841	1	—	1
Westwood	2 537	634	—	1	3
Wrentham*	2 271	2 271	—	—	1
<hr/>					
Total	37 073	Average 1 324	Total 8	6	14

*Plymouth County*

Carver	1 559	1 559	—	1	—
Duxbury	2 244	449	1	1	3
East Bridgewater	3 670	1 223	2	1	—
Halifax	817	—	—	—	—
Hanover	2 709	677	1	1	2
Hanson*	2 277	2 277	—	1	—
Hull	2 619	873	2	1	—
Kingston	2 743	1 371	—	2	—
Lakeville	1 443	—	—	—	—
Marion	1 867	466	1	1	2
Marshfield	2 073	414	2	1	2
Mattapoisett	1 682	841	1	—	1
Norwell	1 666	—	—	—	—
Pembroke	1 621	—	—	—	—
Plimpton	558	—	—	—	—
Rochester	1,229	—	—	—	—
Scituate	3 846	641	—	3	3
West Bridgewater	3 356	1 119	1	1	1
<hr/>					
Total	37 979	Average 974	Total 11	14	14

*Worcester County*

Ashburnham	2 051	1 025	1	—	1
Barre	3 509	1 754	—	2	—
Berlin	1 091	—	—	—	—
Blackstone	4 588	—	—	—	—
Bolton	739	—	—	—	—
Bolton	1 361	—	—	—	—
Brookfield	1 309	1 309	—	1	—
Charlton	2 366	2 366	—	1	—
Dana	387	—	—	—	—
Douglas	2 403	2 403	—	1	—



## Worcester County (Continued)

Dudley	4 568	2 284	—	—	2
East Brookfield	945	945	—	—	1
Hardwick	2 379	—	—	—	—
Harvard	952	476	—	1	1
Holden	3 914	783	2	1	2
Hopedale	3 068	1,534	1	—	1
Hubbardston	1 000	—	—	—	—
Lancaster	2 590	863	—	2	1
Leicester	4 426	885	1	2	2
Lunenburg	2 124	2 124	—	—	1
Mendon	1,265	—	—	—	—
Millville	1,901	—	—	—	—
New Braintree	436	—	—	—	—
Northborough	2 396	1 198	—	—	2
North Brookfield	3,186	796	1	1	2
Oakham	441	—	—	—	—
Oxford	4 249	1 416	1	1	1
Paxton	731	731	—	1	—
Petersham	718	718	—	1	—
Phillipston	423	—	—	—	—
Princeton	707	707	—	—	1
Royalston	841	420	1	1	—
Rutland*	1 352	—	—	—	—
Southborough	2,109	2 109	1	—	—
Sterling	1 556	778	—	—	2
Sturbridge	1 918	1 918	1	—	—
Sutton	2 408	2 408	—	—	1
Templeton*	4 302	2,151	—	1	1
Upton	2 163	721	1	—	2
Warren	3,662	1,221	1	—	2
Westborough*	4 557	1 519	1	2	—
West Boylston	2 158	2 153	—	1	—
West Brookfield	1 258	1 258	—	—	1
Westminster	1 965	1 965	1	—	—
Total	92 472	Average 1,532	Total 14	20	27

County*	SUMMARY No 1				SUMMARY No 2							
	Total Popn lation	Popu lation of Towns	No Towns With Doc tors	Popu lation of Towns With out Doctors	Towns of Less Than 5 000 Arranged According to Number of Doctors and Population							
		Towns Less Than 5 000			0 500	500 1 000	1 000 2 000	2 000- 3 000	3 000 4,000	4,000- 5 000	To- tal	
Barnstable	36 647	22 073	2	1,147	No Doctors	37	16	22	4	4	1	84
Berkshire	121 099	32 221	17	9 335	One Doctor	7	15	20	17	2	—	61
Bristol	366 465	26 628	3	7 315	Two Doctors	1	4	8	9	4	4	30
Dukes	5 700	5 700	3	540	Three Doctors	—	—	5	9	8	4	26
Essex	504 483	31 386	3	5 717	Four or More	—	—	8	10	8	5	31
Franklin	51 043	21 790	13	7 960	Total	45	35	63	49	26	14	232
Hampden	333 495	18 065	6	5 214								
Hampshire	74 205	16 846	8	3 645								
Middlesex	958 855	60 440	7	9 246								
Nantucket	3 495	3 495	—	—								
Norfolk	320 826	37 073	3	5 583								
Plymouth	166 329	37 979	6	7 334								
Worcester	495 562	92 472	13	17,363								
Total	3 438 204	406 168	84	80 399								

Suffolk County is omitted

SEVEN STATES RECEIVE \$5 000 000 FOR AID  
TO AGED FROM SOCIAL SECURITY BOARD

Grants totaling \$5 087 990 to seven States with approved plans for assistance to the needy aged were announced August 18 by the Social Security Board. This allocation of Federal funds to match State expenditures dollar for dollar up to a combined total of \$30 per month per person is for the period from July 1 to September 30. The States concerned—Connecticut, Illinois, Indiana, Massachusetts, Montana, New York and Rhode Island—estimate that a total of 240 882 persons may require such assistance during this quarter year. Already 179 500 aged persons are receiving aid out of Federal State social security funds in six of these States according to the Bureau of Research and Statistics of the Social Security Board and Montana, which began paying Federal State old age assistance in June estimates that 6 909 aged will be eligible for aid through September 30.

The Social Security Board at the same time announced a grant of \$53 683 to Indiana for assistance to the needy blind during the same period.

The grants announced today are as follows:

State	Federal Grant for Aid to Aged	State Estimates of Number Who Will Require Aid
Connecticut	\$324 540.30	10 000
Illinois	855 792.00	86 000
Indiana	624 467.49	42 000
Massachusetts	1 034 383.61	29 300
Montana	225 000.09	6 909
New York	1 958 376.00	64 065
Rhode Island	65 431.08	2 608
	<hr/> \$5 087 990.57	<hr/> 240 882
	Aid to Blind	
Indiana	\$53 683.87	2 000

BUREAU SERVICE IN PROTECTING HEALTH

Few people realize the service rendered by Better Business Bureaus in the protection of public health by exposing or reporting on misleading or fraudulent medical advertising. By answering public inquiries, by submitting reports to newspapers and radio stations and by bulletins on this subject the Boston Bureau has been performing a service not provided by any other agency. The prevention or discontinuance of questionable medical advertising has depended to a great extent upon the co-operation of publishers and radio stations in refusing advertising shown by Bureau reports to be misleading or fraudulent. In addition of course there are innumerable medical advertisements refused by them by their own censorship and standards.

Furthermore various products have been taken off sale by local reputable merchants as a result of information supplied by the Bureau. While this sys-

tem has not been fully developed it is a fact that merchants are gradually assuming more responsibility as to the type of medical products they sell, particularly when they are dangerous, fraudulent or worthless. There is no doubt that this responsibility will be more commonly recognized by merchants and that it will become a very vital factor in combating fraudulent medical advertising.—*The Bulletin, Boston Better Business Bureau, Inc., July 23, 1936*

CORRESPONDENCE

INJUSTICE TO PHYSICIANS

August 15, 1936

Editor *New England Journal of Medicine*,

After reading a few criticisms of the industrial insurance act I thought that I would cite a few instances of a like character.

Recently I had occasion to act as surgeon in an industrial accident case in which there was a patient with a severe mutilation of the hand. After about two hours of work with the patient under ether and with the aid of an assistant I repaired the damage. The patient was given aftercare by the family physician. The case was referred by the insurance company to the board for lump settlement. Without consulting me or the doctor who had charge of the patient, the board awarded a lump sum. My bill was cut from \$50 to \$30. One-third was deducted from the other doctor's bill. However the lawyer who handled the case was awarded his 10 per cent of the total bill \$175. In other words the legal cost exceeded the medical and hospital bills combined.

Again whenever called on a charity case to testify before the board I am told that no witness fee will be paid unless the patient wins his case. And even when the patient gets a verdict I am informed that on account of the fact that an impartial examination was made there was no fee for me. These witness cases take an hour or two of the doctor's time and the board finds fault because there are no doctors for the plaintiff. In no other court is a witness called to testify without pay win or lose.

Some companies make it a practice to reduce doctors' bills on the chance that the doctor won't bother to dispute the reduction. Well that's up to the individual doctor.

The point I wish to bring out is that the cost of industrial insurance is very little influenced by medical bills when compared with other costs.

I think that the Industrial Board while trying to be fair to the doctor does not take into consideration the time and skill factors. I give considerable time to charity patients during my services at the hospital and I do not find fault. In fact I enjoy doing this work. However there is no call to extend charity to the insurance companies in addition to this already heavy burden. Not being a lawyer the doctor is at a disadvantage; does not know his just rights and cannot go to a lawyer for every question of law concerning his bill. It is difficult to write

a letter explaining in detail some case in dispute and this is always requested by the board before a hearing is granted. If doctors who have some unusual settlements of their industrial work would write a short letter to the *Journal* stating the difficulty, it might help the rest of us to solve our own problems more satisfactorily.

Yours respectfully,

PAUL NETTLE, M.D.

Bradford, Mass

## NOTICE

### UNITED STATES CIVIL SERVICE EXAMINATIONS

Medical Officer, \$3,800 a Year

Associate Medical Officer, \$3,200 a Year

Assistant Medical Officer, \$2,600 a Year

Applications must be on file with the United States Civil Service Commission at Washington, D C, not later than September 8, 1936

### SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

#### CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, AUGUST 31, 1936

Wednesday, September 2—

112 m Clinico-Pathological Conference Children's Hospital

Saturday, September 5—

\*10 a m - 12 m Staff Rounds at the Peter Bent Brigham Hospital Conducted by Dr Reginald Fitz

\*Open to the medical profession

†Open to Fellows of the Massachusetts Medical Society

September 7, 8, and 9—The Cancer Institute See page 309 issue of August 13

September 7 10—International Union against Tuberculosis See page 554 issue of March 12

September 7 11—American Congress of Physical Therapy will meet at the Waldorf-Astoria, New York City See page 52 issue of July 2

September 9 to 12—Sixth Congress of the International Society for Urology For details address Dr Theodor Hryntschak Rathausstrasse 8 Wien I

September 14 and 15—Tercentenary Session of the Harvard Medical School See page 1166 issue of June 4

September 16 21—First International Congress of Sanatoria and Private Nursing Homes See page 803, issue of April 16, and page 264 issue of August 6

September 22, 23, 24—Twelfth Clinical Congress of the Connecticut State Medical Society See page 217 issue of July 30

October 12 18—Third International Congress on Malaria See page 1076 issue of May 21

October 19 23—Clinical Congress of the American College of Surgeons See page 180 issue of January 23

October 19 31—1936 Graduate Fortnight of the New York Academy of Medicine See page 1221 issue of June 11

October 20 22—Academy of Physical Medicine Annual Meeting, Hotel Statler Boston

October 20 23—The American Public Health Association See page 1226 issue of June 11

March 30 April 2, 1937—First International Conference on Fever Therapy Postponement notice See page 52 issue of July 2

April 21 24 1937—American Society for Experimental Pathology See page 1075 issue of May 21

### DISTRICT MEDICAL SOCIETIES

#### MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

October 7—Bear Hill Golf Club Stoneham

November 18—Bear Hill Golf Club Stoneham

January 13, 1937—Bear Hill Golf Club, Stoneham.

March 16, 1937—Danvers State Hospital Danvers

May 11, 1937—Bear Hill Golf Club Stoneham.

KENNETH L MACLACHLAN, M.D Secretary  
1 Bellevue Avenue Melrose

### WORCESTER DISTRICT MEDICAL SOCIETY

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27 Elm Street Worcester

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# The New England Journal of Medicine

VOLUME 215

SEPTEMBER 3, 1936

NUMBER 10

## The Massachusetts Medical Society

### SECTION OF MEDICINE

Lower Section Room, Municipal Auditorium, Springfield,  
Tuesday, June 9, 1936, 2 p m

#### PRESIDING

Dr William D Smith Boston Chairman  
Dr Laurence B Ellis Boston Secretary

CHAIRMAN SMITH Will the meeting please come to order

The first duty of the Section is the selection of the Chairman and the Secretary for the coming year and in accordance with the usual custom the Chair will appoint as the Nominating Committee to suggest names Dr Dwight O'Hara, Chair

man Dr George R Minot and Dr Chester V Jones They will report later and abide the pleasure of the Section

I do not see Dr Hamilton here Apparently she is delayed, so we will pass on to the second paper To those of us who have had our moments of indecision whether to transfuse or not to transfuse in some of our medical problems Dr Bock's paper should be of interest. His subject is "The Use and Abuse of Blood Transfusions"

### THE USE AND ABUSE OF BLOOD TRANSFUSIONS\*

BY ARLIE V BOCK, M D †

THE mass of literature on the subject of blood transfusions accumulated during the past twenty-five years is so great and most of it so readily available that one shows lack of temerity at least to attempt a discussion of the subject before this audience. The transfusion of blood may be a life-saving procedure under certain circumstances, it may be a necessary supportive measure under others, but it is too often undertaken when the doctor can think of nothing else to do after all other therapy has failed. My objective today is to discuss briefly the common surgical and medical conditions for which transfusion of blood is indicated, in which we can expect good physiological results and to point out those conditions in which it is little more than a gesture, done, as it were, to satisfy the urge to do something

#### SURGICAL INDICATIONS

1 Shock Many theories of the cause of primary and secondary shock have been offered by able investigators most of them recently reviewed briefly by Blalock.<sup>1</sup> Because of the complexity of the events no theory yet proposed can be considered the final answer as to the etiology of shock. We know that if treatment of the condition is to be successful it must accom-

plish two things restoration of diminished blood volume and elevation of low blood pressure. Blood volume may be reduced by gross hemorrhage or it may be reduced by blood lost in the periphery of the body as suggested by Freeman,<sup>2</sup> or by extravasation of serum through damaged capillaries. If hemorrhage has occurred, transfusion of blood, together with such supportive measures as heat is the immediate indication. No other therapy is so successful. In shock without much or any hemorrhage, 6 per cent gum acacia in normal saline may be just as effective as blood, and has the advantage of greater availability. Repeated transfusions of blood or infusions of acacia may be necessary but are usually not if no delay has occurred in the first instance. Acacia may be used as a supportive measure until transfusion can be arranged. Prolongation of the shock state results in tissue asphyxia, capillary damage, petechial hemorrhages and rapid change in general to an irreversible state.

One of the common accompaniments of shock is dehydration, a state associated with loss of water, base chloride and increase of nonprotein nitrogen. When such a state exists transfusion alone is not adequate therapy but normal salt solution often in large quantities, should be administered intravenously or it may be given in eight-ounce quantities by rectum every half hour. When facilities permit, serum chloride

Read at the Annual Meeting of the Massachusetts Medical Society Section of Medicine Springfield June 9 1936

†Bock Arlie V—Physician Massachusetts General Hospital For record and address of author see This Week's Isue page 469

a letter explaining in detail some case in dispute and this is always requested by the board before a hearing is granted. If doctors who have some unusual settlements of their industrial work would write a short letter to the *Journal* stating the difficulty, it might help the rest of us to solve our own problems more satisfactorily.

Yours respectfully,

PAUL NETTLE M.D.

Bradford, Mass

## NOTICE

### UNITED STATES CIVIL SERVICE EXAMINATIONS

Medical Officer, \$3,800 a Year  
Associate Medical Officer, \$3,200 a Year  
Assistant Medical Officer, \$2,600 a Year

Applications must be on file with the United States Civil Service Commission at Washington, D C, not later than September 8, 1936

### SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

#### CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, AUGUST 31, 1936

Wednesday, September 2—

12 m Clinico-Pathological Conference Children's Hospital

Saturday, September 5—

\*10 a. m - 12 m Staff Rounds at the Peter Bent Brigham Hospital. Conducted by Dr Reginald Fitz

\*Open to the medical profession

†Open to Fellows of the Massachusetts Medical Society

September 7, 8, and 9—The Cancer Institute See page 309 issue of August 13

September 7-10—International Union against Tuberculosis See page 554 issue of March 12

September 7-11—American Congress of Physical Therapy will meet at the Waldorf-Astoria New York City. See page 52 issue of July 2

September 9 to 12—Sixth Congress of the International Society for Urology For details address Dr Theodor Hrytschak Rathausstrasse 3 Wien 1.

September 14 and 15—Tercenary Session of the Harvard Medical School See page 1166 issue of June 4

September 16-21—First International Congress of Sanatoria and Private Nursing Homes See page 803 issue of April 16 and page 264 issue of August 6

September 22, 23, 24—Twelfth Clinical Congress of the Connecticut State Medical Society See page 217 issue of July 30

October 12-18—Third International Congress on Malaria See page 1076 issue of May 21

October 19-23—Clinical Congress of the American College of Surgeons See page 180 issue of January 23

October 19-31—1936 Graduate Fortnight of the New York Academy of Medicine See page 1221 issue of June 11

October 20-22—Academy of Physical Medicine Annual Meeting Hotel Statler Boston

October 20-23—The American Public Health Association See page 1226 issue of June 11

March 30 - April 2, 1937—First International Conference on Fever Therapy Postponement notice See page 52 issue of July 2

April 21-24 1937—American Society for Experimental Pathology See page 1075 issue of May 21

### DISTRICT MEDICAL SOCIETIES

#### MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

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November 18—Bear Hill Golf Club Stoneham

January 13, 1937—Bear Hill Golf Club Stoneham

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glands and so forth we would think less than we do of overloading the circulation. Every physician dealing with this problem should read Meek and Evster's<sup>6</sup> paper of 1922 on the effect of plethora on diastolic heart size and output of the heart. They gave intravenous injections of acacia normal saline, and whole blood to normal dogs in quantities varying from 25 to 103 per cent of the total blood volume without increasing permanently the diastolic size of the heart as demonstrated by x-ray measurements. Hemoglobin estimations indicated that most of the injected fluid was still in the circulation and they demonstrated that capillaries and venules acted as reservoirs for storage of excess fluid. If results like this can be achieved at a time when the vascular bed contains its normal quota of blood, there is little ground for the belief that the circulation will be embarrassed by transfusion at a time when the total circulating volume is decreased.

Another idea about which there seems to be some confusion is the necessity for small blood transfusions, due in part to such considerations as the effect upon blood pressure in the presence of hemorrhage, overloading of the circulation and in part to the effect upon the bone marrow in producing blood. With reference to effects on the blood pressure and heart if there is known disease of the heart or if acute pathology of the lungs is present the transfusion of citrated blood is the method of election since due time can be taken for the injection of relatively large quantities of blood. The hasty injection of blood by the paraffine tube method may produce ill-effects in the face of diseased heart or lungs. With reference to the effect of transfusion upon the bone marrow there is a notion that small transfusions stimulate bone marrow activity and large transfusions depress this function. I know of no data in man to support either of these contentions. In dogs, aplasia may result from repeated transfusions. Small transfusions are apparently of use in the rare severe cases of icterus neonatorum and in two other conditions purpura hemorrhagica and hemophilia, to be mentioned later.

There is no risk of transfusion as Minot has pointed out comparable with that involved in the administration of incompatible blood. Proper matching of the blood of recipient and donor must not be neglected. Careless technique also is responsible for many bad results.

The following medical conditions may require treatment by blood transfusions:

1 *Gastrointestinal Hemorrhage* Severe bleeding such as may occur from duodenal ulcer may present an emergency the treatment of which requires experience and knowledge of physiologic effects produced by hemorrhage. The general condition of the patient and the

pulse rate must be watched closely. The indications for transfusion are discussed above.

2 *Secondary Anemia* There are many cases of secondary anemia due to chronic blood loss. In this category may be mentioned cases of uterine bleeding, bleeding from diaphragmatic hernia, duodenal ulcer and hemorrhoids. Occasionally transfusion may be necessary in such instances but usually care as to diet and the administration of adequate amounts of iron, such as ferrous sulphate 12-24 grains daily, constitute good therapy when the bleeding has been stopped. The anemia of pregnancy and nutritional anemia usually respond to the latter therapy also.

3 *Hemophilia* In many cases of hemorrhage, due to the nature of this disease, transfusion of blood may be necessary to stop bleeding. Patek and Stetson<sup>7</sup> have recently shown that the coagulation time of hemophilic blood can be effectively reduced by the injection of relatively small quantities of blood 100-200 cc. The duration of the effect is shorter than when larger quantities of blood are given. They suggest in the face of persistent hemorrhage giving a transfusion of 500 cc or more and following this with small transfusions every second day or so until healing of the site of hemorrhage has advanced to a safe state.

4 *Purpura Hemorrhagica* There is good evidence that transfused blood acts almost as a specific in controlling this affection. There are certain acute cases and some chronic cases in which splenectomy may be necessary but this step should not usually be taken unless repeated transfusions have failed. Jones and Tocantins<sup>8</sup> have shown that small frequently repeated transfusions give more favorable results than may be obtained by large transfusions. They use amounts up to 300 cc. We do not know the cause of this disease or why the administration of blood has such favorable action.

5 *Pernicious Anemia* Since the advent of liver therapy the idea has become prevalent that transfusion is a menace rather than a help in pernicious anemia. It is true that liver therapy has removed the former necessity of blood transfusion in most of these cases. Transfusion of blood however, is still the first line of defence in those cases exhibiting an acute psychosis or which may be on the verge of this state, and in cases in a moribund state with or without evidences of congestive failure. Transfusion may of course fail to save extreme cases but the presence of pulmonary râles, low blood pressure and so forth should not deter us from transfusing a large amount of blood slowly by the citrate method. The shock-like state of such patients is a direct result of prolonged anoxemia and cannot often be corrected except

determinations form a useful guide as to the amount of salt required

2 *Hemorrhage* The use for transfusion following hemorrhage is obvious but one important phenomenon has not received the attention which it merits. During the war Robertson and I<sup>3</sup> repeatedly observed the fact that following hemorrhage the systolic blood pressure might be held for relatively long periods at levels of 125 to 140 mm, accompanied by a rapid pulse. This finding at first gave us a sense of security. After a few hours such a patient might be found in shock. There appeared to be little doubt that a widespread peripheral vasoconstriction had sustained a normal or somewhat elevated level of blood pressure and that shock appeared upon failure of this mechanism. Now, Freeman<sup>4</sup> believes that tissue asphyxia under these circumstances ultimately causes the breakdown of the vasoconstrictor system, with resulting fall in blood pressure and precipitation of shock. He has made similar observations concerning the blood pressure reactions in the attempt of the body to maintain the circulation.

In civil practice the above mechanism is seen most often following hemorrhage from duodenal ulcer. If the hemorrhage is severe, with rapid fall of hemoglobin to 50 or below, with pulse rate 120 or more, even though the blood pressure may remain at a normal level, transfusion should be undertaken without delay. This therapy is often not done on the ground that transfusion will raise the blood pressure and thus induce more hemorrhage. This fallacy is one of the most persistent in the medicine of today. It arises from false reasoning, or the lack of reasoning, rather than from direct observation of events. If blood pressure is low in these circumstances transfusion tends to restore a normal level, if the blood pressure remains at a normal level or is raised somewhat above normal, transfusion of 500 cc or more of blood will not cause an increase in blood pressure. Furthermore, the introduction of normal blood is the most effective method, short of ligature of the bleeding vessel, that we possess to insure cessation of hemorrhage by establishing closure of an open vessel through blood clotting. Transfusion of blood may be life-saving under these circumstances. It may be necessary to repeat it several times, especially if the patient is fifty years of age or older because of sclerosis of the bleeding vessel. Surgery, until the bleeding has been stopped, is notoriously dangerous. After severe hemorrhage from other causes, such as trauma, transfusion of blood may not only prevent shock but will do much to shorten the period of convalescence. Surgeons as a whole would do well by their patients if they knew more about hemoglobin es

timations and red cell counts than seems to be the case generally.

3 *Sepsis* It is possible to waste more blood in the treatment of sepsis than for any other one condition. With the exception of hemolytic streptococcal infections, if the necessary surgery has been accomplished, more can be done for the welfare of the patient by prevention of dehydration through maintenance of normal serum chlorides than by transfusion of blood. Severe anemia due to sepsis is an indication for transfusion, but sepsis per se without evidence of anemia is not an indication for this procedure.

In severe infections with hemolytic streptococcus, Lyons<sup>5</sup> has recently published important data concerning treatment by transfusion. A donor is selected who is found by appropriate tests to have a relatively high titer of antibacterial antibody for the particular hemolytic streptococcus causing the infection. Transfusion with such blood may confer sufficient passive immunity to abort the infection within a few hours. The technique of selecting such a donor can only be carried out by a trained worker so that immunotransfusions of this type, involving a somewhat complicated technique, can only be done where facilities for proper study of the case are available. It would be a matter of chance if transfusion, carried out in the usual way, achieved a notable result.

4 *Other Conditions* Surgeons are often obliged to transfuse patients suffering from anemia due to cancer, ulcerative colitis, and so forth, before and after surgery is attempted. This is valuable supportive treatment without which many surgical procedures would fail. Obstetrical practice occasionally presents problems in the treatment of toxemias in which the technique of plasmapheresis may play an important rôle. Here the patient is bled, the corpuscles separated from the plasma, washed, and re-stored to the body in a medium of normal saline or Locke's solution.

#### MEDICAL CONDITIONS

\* Before proceeding farther, I should like to discuss for a moment an idea apparently held about transfusion of blood. There is a time honored fable about overloading the circulation. Because in many conditions for which transfusion is considered the pulse is rapid and feeble and the blood pressure low, the impression may be created that the heart is in a state of partial failure. This notion arises because the condition of the pulse and the state of the blood pressure are relatively objective phenomena, and readily observed. The crying need of the rest of the body is not so easily ascertained. If we could as readily observe the state of the cells of the brain, kidneys, capillaries, endocrine



- 3 Robertson O H and Bock A V Blood volume in wounded soldiers 1 Blood volume and related blood changes after hemorrhage J Exper Med 29:139 1919
- 4 Freeman Norman To be published.
- 5 Lyons Champ Immunotransfusion and antitoxin therapy in hemolytic streptococcus infections J A M A 105 1972 (Dec. 14) 1935
- 6 Meek W J and Exter J A E Effect of plethora and variations in venous pressure on diastolic size and output of heart Am J Physiol 61:156 (June) 1922
- 7 Patek Artaur J and Stetson Richard P To be published
- 8 Jones H W and Tocantins L The treatment of purpura hemorrhagica J A M A 100:53 (Jan 14) 1933
- 9 Pemmerenke W T Slavin H B Karther D H and Whipple G H Blood plasma protein regeneration controlled by diet Systematic standardization of food proteins for potency in protein regeneration Fasting and iron feeding J Exper Med 61:261 (Feb.) 1935
- 10 Atchley Dana W The rôle of peripheral circulatory failure in clinical medicine New Eng J Med 213:561 (Oct. 31) 1935

CHAIRMAN SMITH I have a plea from the extreme rear of the hall that the speakers should try to speak directly into the microphone Someone suggests that if they will put their arm about it as they read their papers no one will miss any features of the talk

The discussion of this paper will be opened by Dr George R Minot of Boston

DR GEORGE R MINOT Boston When Richard Lower wrote his paper describing his famous experiments on transfusing blood from one animal to another in February 1665, he entitled the communication A Method of Transfusing Blood He paid detailed attention to technic That aspect of transfusion must not be forgotten I will not review that topic but wish to stress the importance in performing citrate transfusions of using strictly freshly distilled water distilled in hard glass not soft glass or metal stills Attention to this matter will aid in preventing certain common reactions as will attention to the type of rubber connections used and chemical cleanliness

The donor, of course must be healthy and selected by carefully performed "agglutination tests" It is wise to select one who is subject to no allergic condition and who has not eaten for six hours Even with all precautions taken reactions that are not well understood occur in severely anemic patients They resemble circulatory failure or shock and develop one to twenty four hours after transfusion It is this type of reaction that makes it desirable to try to avoid transfusion in cases of chronic severe anemia like pernicious anemia where liver extract rather than blood is almost always the primary need However in severe anemia of deficient states like pernicious anemia if when the patient is at complete rest in bed distinct clinical signs of insufficient oxygen carriage are present transfusion is wise If the patient has a cardiac lesion such symptoms may occur when there is a relatively high level of hemoglobin and anginal symptoms and those of congestive failure when

associated with insufficient hemoglobin for the given demands may diminish greatly following transfusion It is better to avoid transfusion unless such symptoms are very pronounced Reflection indicates that transfusion is rarely needed in pernicious anemia since clinical improvement occurs within a few days after adequate liver therapy

Since the regular use of blood to cure hemorrhagic disease of the newborn few infants die of this condition in contrast to over 80 per cent about thirty five years ago In other hemorrhagic conditions the benefit of transfusion is largely passive and usually the effect lasts but a few days What we need for hemophilia is material to meet with regularity the deficiency of the clotting mechanism The work of McKhann and Elev which shows that the distinct value of a placental extract has great promise and Pateks and Stetsons observations bear on the problem

In leukemia, as in other fatal diseases transfusion may keep the patient alive until the diagnosis is established and serve to check disagreeable hemorrhagic manifestations It may enable some of these patients to lead a more comfortable existence when otherwise they would be confined to bed Often the decision regarding transfusion in leukemia depends on the demands of the family and becomes a problem of ethics and morals

The use of transfusion in the different varieties of idiopathic chronic aplastic anemia with not only physiologic aplasia but also partial anatomic aplasia is comparable with the use of transfusion in pernicious anemia before the days of liver therapy It can act to keep the patient on his feet, perhaps actually initiate a remission, and it has led with repetition at varying intervals to some of these individuals maintaining a useful life for often three and even over eight years

The chief value of transfusion of blood is found in its immediate effects in increasing blood volume, hemoglobin concentration, and factors concerned with the coagulation of the blood and if donors are properly selected in combating certain types of streptococcus infection

CHAIRMAN SMITH The subject is now open for discussion from the floor but the Chair will have to ask each discussor to come to the platform Otherwise he will hardly be heard We will also ask the discussors to give their names and addresses to the stenographer before beginning to talk

If there is no discussion from the floor, we will go on with the next paper We are fortunate in having here this afternoon an authority on a subject of constantly increasing interest that is in industrial hazards The next paper will be Some New and Unfamiliar Industrial Poisons by Dr Alice Hamilton Assistant Professor of Industrial Medicine Emeritus Harvard Medical School Dr Hamilton

## SOME NEW AND UNFAMILIAR INDUSTRIAL POISONS\*

BY ALICE HAMILTON, M D †

THE title of this paper is in a way, incorrect for several of the substances that will be considered have been known to be poisonous for many years Their increased use in industry however has placed them in the group of industrial poisons and has brought to light new and unfamiliar effects

Read at the Annual Meeting of the Massachusetts Medical Society Section of Medicine Springfield June 9 1936

\*Hamilton Alice—Consultant United States Public Health Service and United States Department of Labor 1936 For record and address of author see This Week's Issue page 46

The poisons I will discuss briefly are certain chlorinated hydrocarbons widely used as degreasers, dry cleansers solvents for rubber, gums resins waxes, thinners for coatings of many kinds also in old poison carbon disulfide which is now very important and has revealed an amazingly complex nature, and finally, a number of compounds which have apparently damaging effects of various kinds on the blood In connection with all these our

by immediately increasing the oxygen-carrying capacity of the blood

6 *Chronic Benzol Poisoning* Long exposure to benzol in susceptible cases may produce a severe aplastic state of the bone marrow, accompanied, of course, by grave anemia. Repeated transfusions carried on for months, and in some instances years, are the only known therapy.

7 *Low Serum Protein* In cases of nephrosis, nutritional anemia and acute yellow atrophy frequent attempts have been made to increase low levels of serum protein by transfusion. In rare cases successful results have been obtained but for the most part the therapy offered by blood transfusions appears to be useless. The constant loss of protein through the kidneys in nephrosis may be a factor. In nutritional anemia no such external loss of protein occurs, but the failure to raise serum protein by transfusion is about as notable as in nephrosis. A more logical mode of attack seems to be the feeding of proper proteins as suggested by the work of Pommerenke, Slavin, Kariher and Whipple.<sup>9</sup>

8 *Medical Shock* There is a variety of medical conditions which produces a state of shock, such as diabetic coma, collapse in lobar pneumonia, and infarction of the heart incident to coronary thrombosis, in the treatment of which transfusion may occasionally be necessary but the major therapy lies in the direction of replacing salt loss and water loss. Other therapy is often indicated but, unless the electrolyte and water balances are restored, success is not likely to be attained. The picture of cardiac failure so often present prevents many physicians from applying the use of saline solutions, but I suggest to them a trial of such simple measures. The use of salt as such and of normal saline in the routine treatment of lobar pneumonia, for example, ranks with good nursing care in my judgment. Atchley<sup>10</sup> has recently given an excellent review of the problem in general.

9 *Miscellaneous Conditions* The transfusion of blood has a place in the preoperative preparation of long-standing cases of obstructive jaundice. It is often necessary in cases of bleeding due to cirrhosis and Banti's Disease, in severe cases of hemolytic anemia, acute yellow atrophy, aniline and other poisonings. There are not infrequently cases of chronic anemia of unknown etiology not benefited greatly by any therapy except transfusion of blood which may have to be done repeatedly over many months.

#### THE ABUSE OF TRANSFUSION

Physicians as a whole possess an admirable trait in manifesting a desire to leave no stone

unturned in the general care of patients. The sense of responsibility we feel not infrequently leads us into a morass, retreat from which may be painful to say the least. A typical instance of this is represented by a lesson difficult to learn, that is the use of blood transfusion in the type of case we call, for the want of a better name, acute leukemia. Once the diagnosis is made, the family should be informed of the inevitable outcome, and, if the subject of transfusion is brought up, they should be advised against it. If transfusions are attempted, one of two things generally happens, either a severe fatal transfusion reaction occurs or life may be miserably prolonged for a few weeks. In chronic leukemia, there may be occasional circumstances justifying transfusion but usually there appears to be little justification for the procedure.

The anemia of Hodgkin's disease (malignant lymphoma) is not an indication for transfusion since the presence of the anemia is evidence of the terminal state. The impulse to transfuse these cases springs from hope eternal but has no rational basis unless there is some extraordinary reason for attempting to postpone the end.

The same remarks apply to the problem of transfusing cases of chronic nephritis, of malignant hypertension and other conditions. Patients are also being transfused because of weakness and debility due to various causes with results seldom worth the effort. As a ship needs a rudder, the doctor needs to know the reason why before he attempts such a major therapeutic effort.

In conclusion, it seems clear that transfusion of blood is a useful method of therapy in combating medical and surgical shock, in treating cases of severe hemorrhage and in cases of secondary anemia in which the cause is due to blood loss. The procedure should be used as a preoperative and postoperative measure in cases exhibiting anemia such as may occur in cancer, ulcerative colitis, uterine bleeding and sepsis. Immunotransfusions in hemolytic streptococcus infections appear to have a promising future. Transfused blood has a specific action in stopping bleeding due to hemophilia and apparently also in purpura hemorrhagica. Repeated transfusions may tide over cases of chronic benzol poisoning until the bone marrow becomes competent. Except in pernicious anemia, and then only under special circumstances, there is little use for transfusion in primary blood diseases.

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1. Blalock, Alfred. Acute circulatory failure as exemplified by shock and hemorrhage. *Surg. Gynec. & Obst.* 55:51 (March) 1934.
2. Freeman, E. Decrease in blood volume after prolonged hyperactivity of the sympathetic nervous system. *Am. J. Physiol.* 103:155 (Jan.) 1933.

form of Parkinson's disease of which several instances have occurred in Italy and are assumed to point to a lesion in the globus pallidus of the corpus striatum<sup>5 6</sup> The tremor is like that of paralysis agitans Polyrneuritis, affecting the nerves of the lower extremities, has been described also and sexual impotence is a very common symptom in men Ranelletti<sup>7</sup> analyzed one hundred histories of carbon disulphide poisoning, seventy-seven of them from the artificial silk industry, and found eighty with involvement of the central nervous system, fifty-two of these with mental derangement, mainly of a maniacal type, with delirium or hallucinations, but a few instances of dementia The attack usually began, after an exposure of some months or even years, with depression, rarely with sudden excitement and hallucinations I have seen an instance of each of these forms of onset The paralysis affected the motor fibres more than the sensory although in ten instances there were neuritic pains Ranelletti found that recovery was surprisingly rapid except in cases of dementia

The morphologic changes of the central nervous system consist in fatty degeneration of the ganglion cells which has been observed in the cerebral cortex, the gray matter of the cord, the spinal ganglia and recently in the basal ganglia of the brain

In view of the wide distribution of rayon manufacture in this country and the general ignorance concerning its dangers, we must conclude that here is an important subject for study by the toxicologist, the psychiatrist and the industrial physician

Carbon tetrachloride has been thoroughly studied by pharmacologists in connection with its use as an anthelmintic and our experience with industrial intoxication from the fumes of this compound has in most respects confirmed the laboratory findings Thus MacMahon and Weiss<sup>8</sup> found in a human victim in the blood of the large pulmonary arteries and the right side of the heart 60 per cent of fat, a condition which Rosenthal and Lillie,<sup>9</sup> had produced in dogs, Butsch<sup>10</sup> had a case of industrial poisoning with symptoms simulating portal cirrhosis, such as Bollman and Mann<sup>11</sup> had found in dogs, and Ravina<sup>12</sup> used Minot and Cutler's discovery that the severity of carbon tetrachloride poisoning is increased by a negative calcium balance<sup>13</sup> in treating successfully cases of intoxication in man In both human and animal poisoning alcohol has a markedly favoring influence

However, it is well to remember that human poisoning differs from experimental poisoning in animals in some respects In the latter, it is the damage to the liver that dominates the picture, the kidneys are much less involved In

man, although there is at first severe vomiting, intestinal pain, diarrhea, jaundice and tenderness over the liver, and an excess of blood urea and diminished excretion of urine that may also be traced to liver damage, still, in fatal cases there is evidence of profound involvement of the kidneys, increasing oliguria, generalized edema finally complete anuria and uremic convulsions

A rare feature of this form of industrial intoxication is an involvement of the optic nerve with visual disturbances resembling those caused by carbon disulphide namely, bilateral, peripheral narrowing of the visual fields Five such cases were recently reported by Wirtschaffel<sup>14</sup>

Carbon tetrachloride is a very important element in industry because it is noninflammable and it is an excellent solvent for fats and gums, natural and synthetic It is also volatile These last two properties, that it volatilizes rapidly and has a strong affinity for fats, explain its danger to the worker

Ethylene dichloride is a newer solvent belonging to this class, the proper chemical name is dichlorethane It is the solvent most used in making photographic films, it is beginning to be used as a degreaser in laundries and in the dope used for coating the interior of beer vats This last job, which is obviously dangerous if a toxic solvent is used, gave rise to very distressing cases of methyl alcohol poisoning with blindness and sometimes death in the period before prohibition when beer vats were lined with shellac dissolved in wood alcohol The widespread poisoning from drinking methyl alcohol in the early years of prohibition gave the public an even exaggerated fear of this solvent and nowadays one rarely finds it in use without great precautions to protect the worker However, the lining of beer vats has not lost its danger Recently two men engaged in this work were overcome by the fumes of ethylene dichloride, one dying some hours later The autopsy showed excess of fat in the blood, and suggested the possibility that fat embolism rather than asphyxiation was the cause of death

Another beer-vat fatality was unofficially reported not long ago, but here the solvent used in the lining coat was not ethylene dichloride but trichlorethylene This compound has come into use not only as a solvent for coatings but for all the uses to which carbon tetrachloride has for many years been put It appears to be a more powerful narcotic than the latter and the cases reported from industry are numerous but, for the most part, not serious revealing no such organic damage as occurs from the older poison Stüber,<sup>15</sup> has collected no less than 284 cases chiefly from German sources, some from English and Austrian none from this country Most of these were cases of acute narcosis,

knowledge is still very incomplete, it is like a picture puzzle which has been put together only in spots. The spots are clear and distinct but we have no idea what the many empty spaces should contain.

Carbon disulphide is not a new poison. It is one of the oldest industrial poisons but I find that in this country it is almost unknown. Not long ago, having heard from a young medical graduate of a number of cases of psychoses of various kinds which had occurred recently in men and women employed in a large artificial silk factory, I wrote to one of the physicians in charge of the nearest state asylum for the insane asking him if he had reason to believe that any of the cases of insanity committed to the asylum from that town were caused by exposure to carbon disulphide. He wrote back in answer that he had never heard of carbon disulphide in the rayon industry and had no idea what its poisonous action would be. A few years before this I had had a long telegram from another state signed by an industrial nurse which informed me that an epidemic of insanity had broken out in a rayon factory and the doctors wanted to know what it meant.

It happens that both these plants are situated in states which have no occupational disease compensation, the employer escapes all expense for such cases unless, as rarely happens, suit for damage is brought in a civil court. In these states it is still possible to cover with a mantle of almost complete secrecy unpleasant features of industry and I have never been able to follow up the interesting beginnings of these two stories. I do know, however, from experience in more advanced states, that carbon disulphide poisoning in rayon manufacture means inexcusable negligence.

Carbon disulphide came into prominence with the rubber industry and the literature concerning its toxic action began in 1851, ran through the 80's and 90's up to 1905, then there was an interval which represents safer practices in rubber manufacture, and then suddenly, in quite recent years, a flood of medical reports has come from France, Italy, Holland, Germany and Japan telling of cases of intoxication from its use in that new and growing industry, the making of artificial silk.

Rubber, to make it usable must be vulcanized which means that sulphur must be incorporated with it and there are two ways of effecting this, either to introduce flowers of sulphur with heat and pressure or to use sulphur monochloride with carbon disulphide dipping the goods in the mixture or hanging them in the vapors. On the Continent and in England in the early days, the latter method was largely used and it was carbon disulphide that gave the rubber industry a place among the dangerous trades. In this country, heat vulcanization has

been the method preferred and, although up to some fifteen years ago it was still possible to find the so-called "acid cure" in use, nowadays carbon disulphide has practically disappeared from American rubber manufacture, and, far from being a dangerous trade, the records of our great rubber city, Akron, Ohio, show that it can be made one of the least harmful to the health of the workers.

But when carbon disulphide disappeared from rubber factories it came into sudden prominence in a new industry. Artificial silk is produced in various ways, only one of which requires this reagent, but, unfortunately, the one which does is most widely used all over the world, namely, the rayon process. Cellulose, after treatment with strong caustic alkali solution, is placed in a great revolving cylinder with carbon disulphide which changes it to cellulose xanthate, a yellow rubbery mass. It is quite possible to carry on this reaction and to handle the resulting xanthate without exposing workers to the poison, as I have seen done in well-managed factories but the reports that come to us from abroad and the vague rumors from some of our states show that factory hygiene is faulty in many cases.

Carbon disulphide is a specific poison to the central nervous system, a severe generalized nerve poison. The chronic form, which alone is important in industry, is characterized by paralyses and psychoses of various kinds and a typical toxic amblyopia. Much careful work was done in this field by the Germans some thirty years ago and the physician interested in the subject is referred to the articles by Quensel,<sup>1</sup> by Laudenheimer<sup>2</sup> (who analyzed fifty cases of insanity and paralysis in Flechsig's clinic in Leipzig) and by Koster<sup>3</sup> who asserts that carbon disulphide is as variable in its action on the central nervous system as alcohol or lead. The most usual form of insanity is the manic depressive type, which lasts for some months or a year or two, then usually clears up but in rarer instances passes into lasting dementia. The paralysis is usually motor, affecting chiefly the peroneal muscles and the extensors of the forearms. In some cases there are coarse jerking movements, muscular contractures or tabes-like ataxia. Recovery is fairly rapid if the exposure ceases. Dimness of vision is a common symptom and, according to Birch-Hirschfeld (see Koster), the lesion caused by carbon disulphide is like that caused by lead and by alcohol, a retrobulbar neuritis with atrophy of the optic nerve.

The latest studies of carbon disulphide poisoning come to us from Italy and France. The histories show retrobulbar neuritis, sometimes transient, sometimes resulting in permanent loss of visual acuity. Paralyses of various kinds are reported, the most interesting of which is a

inflammation, seems also beyond doubt. But much more numerous are the cases of bronchopneumonia in men who have inhaled smaller doses over a long period, who have never been narcotized. About such cases, we find it impossible as yet to speak positively, that is, with the degree of certainty which is necessary before a compensation board.

As clinicians you have all doubtless been interested in the researches in various new forms of apparently primary blood disease, the anemias and leukemias which we call idiopathic in the sense that their cause is as yet undiscovered. The literature of Schultz's agranulocytic angina is already very voluminous and includes such a variety of pictures that it is now no longer regarded as a clinical entity and while in some instances a bacterial agent seems to be the exciting cause, in others the suppurative lesions are apparently only a secondary feature, and of late the action of some drug is suspected. In connection with the last, we are all familiar with the cases of aplastic anemia which followed Koranyi's treatment of leukemia with benzol and those reported from time to time as following treatment with salvarsan and neosalvarsamine. More recently amidopyrine barbiturate compounds have been accused of causing agranulocytosis and Schustrow and Salisowskaja<sup>22</sup> have reported three cases with two deaths which were attributed to alphasulfonphenol, recently introduced for the treatment of obesity.

Now here is another large and interesting field which awaits the student of industrial diseases, a field largely unexplored as yet, with the exception of benzol, and even there the cases actually studied are few, not half so numerous as the cases of agranulocytic angina, although Schultz's first article appeared only fourteen years ago. Diseases of the blood in industrial workers are classed as idiopathic always unless benzol can be incriminated and even then, if the clinical and histologic picture differs at all from the accepted standard of typical aplastic anemia. Yet we are ready enough to admit variations in the blood findings and presence or absence of hemorrhage and of suppurative lesions in nonindustrial cases, attributing such variations to the degree of marrow injury and the particular elements of the marrow most affected.

There are several toxic compounds of more or less importance in industry which have been studied with sufficient care to enable us to speak with certainty of their probable action. Alpha dinitrophenol is one, for it is an essential ingredient of the French explosive, melinite, and during the war we learned enough of its character to be amazed and alarmed when we found it was being recommended as a safe remedy for obesity. Two other compounds of this same

group nitro derivatives of the benzene ring were also studied exhaustively during the war: trinitrotoluene and dinitrobenzene, both of which are capable of severely damaging the bone marrow. These three are used in industry in the production of dyes and drugs and so is a whole series of related compounds about which we know less: the nitranilins and chloranilins, the chloro- and chloronitrobenzenes, the toluidins, the chloritoluidins and the diamines, acetanilid, all of them important intermediates and all producing blood changes which by some are said to consist chiefly in the formation of methemoglobin, by others in destruction of red blood cells with slow regeneration, by others in actual hemolysis like that caused by arsine.

Tetrachlorethane was a war poison of great importance, for it was the solvent best adapted for use in airplane dope. Before it was abandoned by the Germans and the British on account of its toxic nature, it had caused in both countries a number of cases of fatal acute yellow atrophy of the liver.<sup>23</sup> In British factory inspection reports such cases are listed under "toxic jaundice", together with poisoning from arsine. Tetrachlorethane also proved to be destructive to the blood-forming tissues of the bone marrow and instances of typical aplastic anemia occurred. In this country this solvent was for a while used in the making of artificial silk and Minot and Smith<sup>24</sup> were able to detect in the blood of workers exposed to the fumes an early change which served to give warning of danger. This was the appearance of a relatively large number of leucocytes of the endothelial type, up to some 40 per cent, and in some instances these would show degenerative changes.

Trinitrotoluene is another of the benzene derivatives which was found during the war to exert, in exceptional cases, the action typical of benzene, the victims developing aplastic anemia, granulocytopenia and thrombopenia. Kegel and his colleagues<sup>25</sup> found that the cases of poisoning from methyl chloride fumes, in the famous mass poisoning in Chicago, showed in their blood during the first week, findings typical of aplastic anemia.

There are many as yet unsolved problems in this field. Benzene has been assumed to exert one action only, a destruction of the elements of the bone marrow concerned in the production of erythrocytes, granulocytes, and thrombocytes. But, aside from reports of benzene workers whose blood shows a stage of marrow irritation, we have now several instances of blood pictures diverging widely from the accepted standard, such as anemia with active regeneration and even leukemia. (See Andersen<sup>26</sup>.)

Still more obscure is the question whether petroleum benzine—as distinguished from coal tar—or naphtha or gasoline, has any destruc-

rarely severe, and fatal only if the victim could not be rescued in time—an accident which has happened in this country as well. Included in this list are cases which must be regarded as dubious for the lesions cannot be produced in animals nor are they observed in man when pure trichlorethylene is used therapeutically in the treatment of facial neuralgia.

This form of treatment, it will be remembered, was based on the report made in 1916 by Plessner,<sup>16</sup> of four cases of a very unusual form of industrial intoxication which came on after a few hours' exposure to what was supposed to be trichlorethylene. The first symptom was a slight transient narcosis, followed by numbness of the lining of the mouth and of the nose and of the skin of the face with impairment of the sense of taste and of smell. The numbness was bilateral in three of the four cases and two of these three also had impairment of vision with some pallor and edema of the papilla. None of them developed keratitis neuroparalytica, but trophic changes were seen in one man who lost all his teeth. Seven months later Plessner found that the paralysis of the sensory fibres of the trigeminus was still complete. It was on the basis of these cases that Oppenheim recommended the use of trichlorethylene as a remedy for the pain of facial neuralgia and I am told that it is still used for this purpose in our country although, according to the Germans, it does not produce anesthesia of the skin and acts simply as a general narcotic.

The suspicion is strong that Plessner's cases suffered a mixed intoxication, trichlorethylene playing a minor part. In the first place it had been used in that plant for some months without any complaint, then suddenly five men—one was discovered later—developed serious symptoms after only a day's exposure to the fumes. It happened during the war when German manufacturers were forced to use all sorts of substitutes and rarely knew just what they were using. But the researches of Kalinowsky<sup>17</sup> eleven years later weigh even more strongly against the theory that trichlorethylene was responsible for the trigeminal paralysis of Plessner. Kalinowsky saw two cases practically identical with these (bilateral sensory paralysis, loss of teeth) in men exposed to fumes containing some chlorinated hydrocarbons but not di- or tri- or tetrachlorethylene. This led him to trace Plessner's patients (Plessner had died in the interval) but he found only one still living, the man who had been least affected, with sensory paralysis of one side only which was still present. This man had suffered a stroke of apoplexy from which he had recovered but the others had died, apparently from apoplexy. Kalinowsky was told of a fifth

man whom Plessner did not see, a man who worked only two days in the fumes, then became very ill and died of what was called "a stroke." These occurrences can hardly be explained as pure coincidences, but neither can they be attributed to the unaided action of trichlorethylene.

It is true that other instances of paralysis of the sensory branches of the trigeminus have followed exposure to trichlorethylene in industry, Stuber collected four instances, and Baader<sup>18</sup> has seen a case of retrobulbar neuritis and one of optic atrophy following long exposure to this solvent. An American case of retrobulbar neuritis following fourteen months' exposure has been reported to me recently. But in none of these instances is there proof that the compound used was chemically pure and in industry it is not necessary that it should be pure. When it is chemically pure as in therapeutic use, no lasting injury to either the trigeminus or the optic nerve has ever been observed. This is made clear in an article in the *Journal of the American Medical Association* of a few weeks back, in which Eichert,<sup>19</sup> after reviewing the literature of supposed poisoning from this compound, says that he has been able to discover only one nonindustrial case of a toxic syndrome following a prolonged and excessive use of trichlorethylene as a therapeutic agent. He adds two cases of his own, but in none of these three was there any anesthesia of the area innervated by the trigeminal nerve, or evidence of injury to the optic nerve.

One thing, however, must not be forgotten, that clinical and industrial poisoning are not the same, that the lesions caused by prolonged absorption of small doses do not usually appear when large doses are administered at rare intervals. Both lead and benzol are striking examples of the greater damage done by the slow method as compared with the rapid.

In connection with both carbon tetrachloride and trichlorethylene there is a question still unsettled that is very important especially as it comes up in compensation claims. It has to do with the occurrence of bronchial pneumonia or acute pulmonary congestion with edema as a sequel to intoxication from these fumes. In view of the fact that acute pulmonary inflammation sometimes follows surgical anesthesia with chloroform, it seems reasonable to accept as instances of the action of these compounds so closely related to chloroform cases of pneumonia which develop after a severe acute narcosis. One such case in which the broncho pneumonia followed the inhaling of vomitus (see Stuber) is certainly beyond argument and the one described by Koch<sup>20</sup> in which the victim died of severe narcosis and the whole respiratory tract was found in a state of acute



smaller plants where the care of the workers health is not in the hands of an industrial physician

For those physicians working in a community where such exposures are possible it is important in taking the history of a patient who is a worker to go into some detail as to the exact work he was doing, and to find out from him of any possible exposure if his symptoms suggest an acute or chronic intoxication. We are fortunate in having in this state a Department of Occupational Hygiene at 23 Joy Street, Boston, where information as to the contents of substances bearing trade names can probably be obtained. The determining of the exact chemical responsible for a patient's symptoms is extremely difficult, especially in cases where the exposure has been to a group of such substances as is frequently the case.

Dr Hamilton's paper suggests that in addition to a careful industrial history, a routine examination of the blood urine and nervous system may be decidedly helpful in getting an idea of the type of chronic poisoning which may be present.

In the industry with which I am connected a few chemical exposures occur but by very careful protective measures such as hood respirators forced ventilation and skin protection there have thus far been no cases of severe intoxication except one case of lead poisoning.

A great danger of acute poisoning is from painting cleaning or repairing tanks or working in similar poorly ventilated closed spaces where a chemical is used or has been stored. I saw two cases of mild intoxication lasting only about half an hour and having no aftereffects in men painting the inside of a large tank with asphaltum. Since this experience which occurred several years ago no man enters a tank of any kind to do any type of work unless he has on a harness and wears an air mask to which air is pumped from outside.

Dr Hamilton has not spoken of the danger of nitrous fumes in connection with oxyacetylene or electric welding. This hazard has only recently been recognized. In 1934 Bridge<sup>1</sup> stated that at least seven cases of nitrous fume poisoning (one fatal) were reported in England that year as a result of the use of large oxyacetylene burners used to heat heavy steel in a shipbuilding operation where the work was conducted in a confined space.

In 1935 Titus Warren and Drinker<sup>2</sup> studied experimentally the effect of the fumes of electric welding upon animals. The welding time varied from 2 to 5 hours while the animals were exposed at various stages of the welding operation and at various fume concentrations. The animals were exposed to filtered and unfiltered fumes in order to determine whether the fine metallic particles in the fume or the gases were toxic. The effects on the lungs were like those found in animals exposed to toxic concentrations of irritating gases namely pulmonary edema. The cause of the pulmonary edema is not the iron oxide fume but the gases generated by the arc viz. probably nitrogen peroxide and ozone.

In the same year a case of death from welding a galvanized iron tank in a confined space occurred in Washington D C.<sup>3</sup>

Such reports make it obvious that electric welding should not be done in a confined space and that if this is unavoidable an air mask provided with a hose to bring clean air to the worker is imperative.

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CHARLES SMITH Is there further discussion from the floor?

DR GEORGE L SCHADT Springfield Mr Chairman—We have had a most interesting and worthwhile discussion of a subject that in my opinion at least is certainly one of the most pressing before the medical profession today—the problem concerned with the deleterious effects of the newer solvents as poisons on the human system. Dr Hamilton deserves the thanks of every doctor within sound of her voice for bringing to us a discussion of the subject this afternoon.

I should like to discuss this paper for a few moments from the viewpoint of the clinical pathologist and of the family doctor though they do say that there are none of the latter existent in this day and generation and to consider just what interesting and possibly pathologically dangerous conditions may develop in the human organism following employment in industries of these new fangled solutions known as solvents.

Many chemical manufacturers are today developing and putting on the market a great diversity of these new solvents some of them under trade names, many however according to their true chemical names. Unfortunately little if anything is known with reference to the effects on the human system of these solvents either by the manufacturing chemist by the industrialist and by the physician. It would certainly seem to me we should know a great deal more with reference to the potential dangers of many of these solvents before permitting them to be used promiscuously in the various industries. This in my opinion is a problem for the general practitioner since the use of these solvents in industry is increasing by leaps and bounds each day. I have seen many individuals both male and female who in my opinion were suffering from conditions brought about by prolonged exposure or exposure under certain definite circumstances to some of these solvents. I can recall the death of a young woman within the last few years following prolonged exposure to methanol during a period in which long hours prevailed and in which there was an exceedingly high concentration of the solvent in the room in which she worked.

I should like to ask Dr Hamilton about one phase of the problem that she did not touch upon—the question of concentration and of temperatures in which workers are exposed to the fumes of these solvents. The young woman mentioned above was as already stated exposed to a very high concentration of methanol under very high temperature conditions and death took place approximately twenty four hours after she had been overcome. In my opinion this question of concentration and of temperature is most important and one that should be carefully studied.

It is my studied opinion that the general practitioner should give more careful attention to industrial workers, men and women and especially young women who come to him complaining of symptoms which are too easily and too apt to be classified as 'neuritic'. Such symptoms are headache, dizziness, nausea and sleeplessness. Many of these workers also complain of minor kidney disturbances and in practically every instance blood examination demonstrates the presence of secondary anemia. This is an exceedingly important point since I am convinced that if recognized early all of these individuals may be relieved of their symptoms and working conditions may be changed for them.

Another important factor is that of age particularly in the female. We have been impressed with the fact that in young women secondary anemia is very common if not almost universal with hemo-



tive action on the blood-forming tissues. Cases come to our attention from time to time of profound secondary anemia or primary anemia with purpura hemorrhagica or of some variety of leukemia in men who have been exposed for long periods to fumes of petroleum distillates, but, in the present state of our knowledge, we cannot pronounce them to be of industrial origin. And yet Russian experimenters have produced hemolytic anemia of the aplastic type with leukopenia affecting all classes of leukocytes by exposing animals to fumes of naphtha.<sup>27</sup> Smithies of Chicago<sup>28</sup> published histories of four cases and wrote me of two more in which lack of the blood was a prominent feature and in all these there had been exposure to very volatile oil distillates. As for the relation between leukemia and exposure to petroleum fumes, it may be fantastic, and yet we know that certain petroleum and coal-tar derivatives are capable of setting up carcinomatous changes in the skin. Industrial skin cancer from certain oils and tars is far from uncommon. On the theory that leukemia is a cancer of the blood might we not assume, as a working hypothesis, that the carcinogenetic agent in some cases is a volatile petroleum product?

Cases of polycythemia of supposedly toxic origin also are sometimes brought to our attention and here again it is impossible to speak positively. We do know that an increase in the red cell count has been observed to be caused by chronic exposure to carbon monoxide and to hydrogen cyanide and has been seen in the early stages of benzene and of anilin intoxication, and it was a striking feature of the blood of girls exposed to ether fumes in the manufacture of smokeless powder during the war.<sup>29</sup> Devoto,<sup>30</sup> in Italy, found polycythemia in two cases of mercurialism and Kilgore<sup>31</sup> saw two striking cases in feather workers handling various dyes. One of these had over 9,000,000 red cells and the other over 12,000,000. The first victim died and the marrow of the long bones was found to be in a state of erythroblastic hyperplasia. Among the dyes that were used was paraphenylenediamine, perhaps the most probable causative agent. All this does suggest that a careful study of cases of so called polycythemia vera might reveal some toxic agent.

In conclusion, may I beg for a careful, detailed job analysis when the history is taken of a working man or woman who presents a puzzling array of symptoms? It may be that such an analysis will throw light on his or her case and also add a valuable item to our scanty knowledge of industrial poisons.

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CHAIRMAN SMITH. I am sure the Section is grateful to Dr Hamilton for coming here today and giving us this very splendid paper. The discussion will be opened by Dr W Irving Clark of Worcester.

DR W IRVING CLARK, Worcester. It is a privilege to hear a paper in an unfamiliar field by such an authority as Dr Hamilton. The newer industrial poisons are unfamiliar even to one practicing in industry unless they are in use in the factory or factories over which he has supervision. To the general practitioner the opportunity of seeing and treating such cases depends upon the presence of factories or shops in his vicinity in which these chemicals are used. In Massachusetts, which is essentially a manufacturing state, there are probably a large number of possible exposures particularly among the

serious acute liver injury or in advanced chronic disease. Only at such a time do the hepatic cells fail to meet the metabolic and immunologic needs of the body, and only then do the various functional tests begin to give evidence of measurable hepatic failure. It is still needless to talk about liver disease in terms that are far from precise, and careful clinical observations still constitute the basis on which most diagnostic and therapeutic decisions must be made. Nevertheless, a fairly clear idea of our present knowledge of liver function will be of real value in properly evaluating a given case, and a brief review of this knowledge will be proper. I should like to stress my conviction again, however, that with rare exceptions clinical experience and judgments based thereon will continue to be of much greater importance than any laboratory data that can be compiled in almost any given case. In spite of a tremendous amount of painstaking research by numerous investigators, laboratory tests still fail to give information that, as a rule, cannot be gained by the ordinary clinical methods employed in studying sick individuals. Here I should like to suggest a comparison between heart disease and hepatic disorders. It is still true that except in cases where signs of frank cardiac failure exist, an exact measure of cardiac disability is impossible, even with the most refined methods. Unless the cardiac reserve has been overstepped, the organ can compensate sufficiently to render so-called scientific measurements of only general value. The same is true for the patient who has disease of the liver but is still not decompensated. The determination of the prognosis in liver disease is still more baffling, and clinical skill and observation are just as valuable in sizing up a given hepatic disorder as they are in properly evaluating cardiac disease. This is particularly true when one speaks in terms of laboratory tests performed as single observations. Only by repeated determinations on a given patient can one obtain comparative data that will enable the physician to determine the progress of a disease with any greater surety than by careful bedside observations. Rarely can diagnosis be made by laboratory data alone and even in those instances where such diagnosis is made, the possibility of hepatic disorder has been considered or the test or tests would not have been carried out.

What are the functions of the liver that can be measured? I shall discuss only those that seem to possess some practical application to the problem of the sick liver. The best known function is that of glycogen formation or storage. This has been recognized since the time of Claude Bernard and is still the most important single function from the point of view of therapy. To measure the ability of the liver to

handle carbohydrate material, various tests have been devised, and of these the glucose tolerance test is probably the most valuable. Normally this sugar is utilized directly or completely by the liver. When there is intrahepatic damage of sufficient degree such is not the case and there is a greater or lesser amount of glucose excreted in the urine. According to the most enthusiastic reports, in obstructive jaundice after ingestion of this sugar small amounts are found in the urine, in severe diffuse toxic damage to the liver much greater amounts are to be found. Were such always the case, the test would indeed be a very valuable one in those cases of undetermined jaundice which are frequently so baffling. Unfortunately the test is not infrequently absolutely misleading and cannot be relied upon as a certain diagnostic procedure. Like the other tests to be discussed, repeated determinations are of value in following the progress of a given case. A slightly different test for measuring the ability of the liver to handle carbohydrate is the insulin-water test of Althausen.

A more obvious laboratory procedure is an attempt to measure the intensity of jaundice. Although the liver has only a moderate part to play in the formation of bile pigment it has the entire problem of excreting it. Even fairly great variations in clinical jaundice are difficult to measure with the eye. The determination of the icteric index or quantitation of the blood bilirubin by the indirect van den Bergh method offers a fairly accurate method for measuring the depth of jaundice in a given patient. As a diagnostic procedure its value lies in the fact that by its use subclinical icterus can be demonstrated.

Another function of the liver enables it to excrete particulate matter and certain dyes that are brought to it through the blood stream. This excretion capacity, which in large part involves the activity of Kupffer's cells, can be more or less grossly estimated by injecting a dye such as bromsulphalein or rose bengal into a vein, and after half an hour determining the amount of the dye still retained in the circulation. Under ordinary conditions practically no dye will be retained. In the presence of jaundice not due to increased blood destruction the dye will be retained in varying amounts depending upon the depth of the jaundice. In this respect, therefore, the dye test parallels the bilirubin determination and is of value only if repeated tests give comparative values for following the progress of a case. In the absence of jaundice there still may be marked dye retention in advanced disease of the liver such as a toxic cirrhosis and the performance of the test may rarely be of diagnostic value. It also may be of some importance in estimating the operative risk in a given case of jaun-

globin ranging from 65 to 70 per cent, red blood cells 3,500,000 and blood platelets very much diminished. With reference to blood platelets in our experience a decrease is one of the early manifestations of organism reaction to the effects of solvents. The kidney reaction is usually manifested by the presence of albumin in the urine ranging from 10 to 30 milligrams per 100 cubic centimeters. No casts are present as a rule but occasionally a red blood cell is seen. Dr Hamilton has already stressed this and we should certainly be very careful with these individuals to include urinalysis and a blood examination—at least a hemoglobin determination and a red blood cell and blood platelet count.

In conclusion may I express the opinion that the average employer does not, as yet, seem to appreciate fully his responsibility to his employees when solvents of one kind or another are used and when the employees are being exposed to their fumes under varying conditions and situations. As stated early in this discussion the manufacturing chemist, the employer and, unfortunately, the doctor know altogether too little with reference to these products, especially with reference to their deleterious effects on the human system.

It has been a great pleasure to me to listen to Dr Hamilton this afternoon and I do hope that in her closing remarks she will discuss a little more fully the question of concentration values and temperatures and how best to control working conditions with industrial solvents and poisons, thus doing our duty by the workers who ultimately become our patients.

DR B T BURLEY Worcester *Mr Chairman*—Recently I had an experience in the use of trichlorethylene which may be of some interest to the profession in general. A retired physician had been under treatment for trigeminal neuralgia and for mild attacks had resorted to inhalation of trichlorethylene. Recently I had to block a branch of the fifth nerve by alcoholic injection to cut short a severe attack. Though the pain was gone I was informed by the nurse a few days later that the patient was insisting on the use of two bottles of trichlorethylene daily to promote rest and sleep.

This was to me a new experience and I should like an opinion from Dr Hamilton as to the possibility of any habit addiction from this drug.

DR ALICE HAMILTON *Mr Chairman*—With regard to the concentration of fumes it is impossible to speak positively except in the case of benzol, where extensive tests were made of concentration of fumes in the air in actual factories and where that was matched up with the blood pictures of the people working in those factories. In connection with others we have the experiments of the Public Health Service but they have always had to do with measured quantities administered to animals producing acute symptoms. Such conditions do not

concern us much in industry. What we are interested in is chronic poisoning.

I have seen statements as to safe limits of carbon tetrachloride, for instance, that run I believe from 100 parts per million to 10,000. I have a poor memory for figures so I would not wish you to rely on those figures, but if anyone really wants to know what is the safe concentration of carbon tetrachloride I should advise him to write to Dr P A Davis of the Goodyear Tire and Rubber Company. His answer will be based on wide personal experience.

As for temperature of course the higher the temperature the more poison is volatilized and the more deeply one breathes. This increases the amount of poison that is taken up.

The question of the youth of workers is of course important. During the war the experience in every country pointed strongly against the employment of the youthful of both sexes but especially young girls in connection with those poisons that have an action on the blood.

As for the last question cases of addiction to carbon tetrachloride have been reported several times in Germany and I have heard of a few in this country. Lately there have been German reports of addiction to trichlorethylene. The man comes to work in the morning feeling as if he had been intoxicated the night before and is not able to go to work until he has taken some deep inhalations of carbon tetrachloride or trichlorethylene. The case of Baader's I spoke of, optic atrophy, was a trichlorethylene addict.

CHAIRMAN SMITH I have here the report of the Nominating Committee consisting of Dr O'Hara, Dr Jones and Dr Minot. They nominate for Chairman for the coming year Dr Laurence D Chapin of Springfield and for Secretary Dr George D Henderson of Holyoke. Does anyone wish to make further nominations from the floor? It is moved and seconded that nominations be closed. Does someone wish to make the motion that the Secretary be instructed to cast one ballot for Dr Laurence D Chapin as Chairman? It is moved and seconded that the Secretary cast one ballot for Dr Chapin as Chairman. All those in favor will raise their hands. Opposed, it is a vote. Dr Ellis has cast the ballot, and I declare Dr Chapin duly elected.

Do I hear a motion that the Secretary be empowered to cast one ballot for Dr George D Henderson of Holyoke as Secretary for the ensuing year? It is so moved and seconded. All those in favor will raise their hands. Opposed, it is a vote.

Dr Chester M Jones has for several years been doing a very interesting and constructive study on the diseases of the liver in the wards of Massachusetts hospitals. The title of his paper is

'Newer Concepts of Liver Disease and Their Relation to Treatment.' Dr Jones

## NEWER CONCEPTS OF LIVER DISEASE\*

BY CHESTER M JONES, M D †

THE older concepts of liver disease had to deal with confused and fairly inadequate ideas that were associated with such terms as "torpid liver", "bilious attacks", and the like terms of the most general nature and with no

real clinical meaning. Such an unsatisfactory state arose from the fact that the tremendous factor of safety possessed by the organ prevented any adequate estimation of functional disability. Accurate measurement of the functional capacity of the liver is only possible even with the most modern methods, when the number of normally functioning cells has been reduced to a minimum, a point reached only in

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when obvious severe damage exists. Because the liver is intimately concerned with the formation of urea one can at times demonstrate a low blood urea figure in the presence of marked liver damage. Probably of greater significance is the increased ammonia content resulting from this inability to form urea. Here again such laboratory data are chiefly of value as confirmatory evidence of dysfunction, or as means of obtaining comparative data for following progress in a given case.

One important function of the liver lies in the control of normal blood coagulation. In prolonged obstructive jaundice, particularly, this function may be seriously altered with the associated danger of spontaneous or postoperative hemorrhage. Determination of the clotting time by any of the accepted methods provides a gross measure of some value. It is not a specific measure of liver function but at times gives valuable information. An accelerated sedimentation rate, although in no way a specific test of hepatic function, apparently is often of more value in indicating the possibility of hemorrhage and should be done where surgery is being considered in the face of obvious liver disease.

A final type of laboratory study is worth considering both as a measure of liver damage and as an indication for therapy. A type of secondary or hypochromic anemia is of common occurrence in serious liver disease of long standing and is not uncommon in the more acute forms of hepatic disorder. In the absence of definite bleeding, as from esophageal varices, such an anemia is an indication of the severity of the underlying process. In the more chronic forms it is difficult to treat and only large doses of iron are at all efficacious. Recently attention has been directed to the occurrence of a macrocytic type of anemia in liver disease. Such types are undoubtedly seen in the cirrhoses, particularly, and may represent a lack of storage of the hematopoietic principle found in liver. Liver therapy is certainly indicated in such instances but as a rule is not too successful.

I have obviously omitted mentioning many of the other tests of liver function but I have indicated what I consider the most important. As I have already intimated, the diagnostic value of such tests has been as a rule no greater than the clinical acumen of the man performing them. Repetition of any one or of several of them may provide valuable information regarding progress or prognosis in given cases.

Of greater importance in my estimation is the knowledge gained from the studies underlying the evolution of all of these laboratory procedures. From such studies, we are beginning to collect much of value as regards the principles of treatment. In liver insufficiency, whether

acute or chronic, therapy must be directed toward correcting alterations in the numerous functions of this remarkable organ. First and foremost is the removal of specific liver poisons and putting the patient at absolute rest. Next in importance is, without question, the providing of adequate amounts of carbohydrate by mouth or by the intravenous route. Unless this supply of carbohydrate is really adequate, it is not possible to provide properly for liver cell repair and protection. In the sickest cases the administration of glucose by vein offers the surest means of supplying this need. Solutions ranging from 5 to 25 per cent glucose may be employed. Reasonable amounts of fluid are needed but, because of the danger of edema formation, excessive amounts are to be avoided. Relatively small amounts of fat in the diet are to be preferred because in the presence of jaundice the fat is not properly absorbed, with resulting gastrointestinal disturbances. Food rich in cholesterol should also be avoided. In spite of the frequent lowering of the serum protein large amounts of protein are to be avoided. The liver if damaged cannot properly deaminate the amino acids formed from protein digestion, and cannot properly form urea from nitrogenous material. Not until liver function has been sufficiently restored, if this is possible will there be a restoration of normal serum protein values. The provision of generous amounts of glucose is the surest means of bringing about such a restoration of liver function. The protein in the diet should probably be limited to between sixty and seventy grams in the average case, whereas in patients suffering from serious, acute liver injury the carbohydrate intake may properly approach a level of 400 to 450 grams daily. Calcium therapy was hailed with enthusiasm as a means of treating the tendency to hemorrhage in patients with severe jaundice. Its use has proved extremely disappointing, although it may be of some value if combined with viosterol, as suggested by Ivy. When there exists an abnormality in the clotting mechanism due to hepatic failure, blood transfusion provides the most valuable form of treatment, in combination with adequate glucose therapy. In the more acute forms of liver insufficiency, glucose therapy also is the most important therapeutic measure for producing a diuresis if abnormal accumulations of fluid exist in the tissues or serous cavities. The use of diuretics, of which the mercurial preparations are the most effective is indicated chiefly in those chronic liver disturbances such as portal cirrhosis, where the control of ascites and edema is a problem of prime importance.

The control of the anemia associated with diseases of the liver may involve the use of iron or liver, as already noted. Doses of sufficient magnitude are necessary for favorable results,

dice When the dye retention seems to be out of proportion to the depth of jaundice it is undoubtedly true that surgical interference will be hazardous indeed

In some way that is not understood, the liver is involved in the metabolism of cholesterol. Undoubtedly the liver treats cholesterol in part as an excretion product and, in the presence of diffuse liver damage and jaundice, the level of cholesterol is high in the plasma. This is of no particular diagnostic importance inasmuch as there are numerous other determinations of less technical difficulty which will provide similar information. An additional fact of interest, however, is that serious hepatic failure is associated with a change in the cholesterol-cholesterol ester ratio. Normally cholesterol esters constitute over fifty per cent of the total cholesterol. In diffuse liver damage, especially when associated with the existence of jaundice, the esters form a much smaller proportion of the total plasma value than normal. The finding of a low cholesterol ester value certainly indicates poor hepatic function, but unless repeated determinations are made the test is of little real diagnostic or prognostic value.

The liver has a very close connection with the normal distribution of water in the body. Under ordinary conditions this is not an apparent function of the organ. When there exists serious hepatic insufficiency, however, either in the acute or chronic forms of the disease, edema and ascites may occur. It has usually been considered that the occurrence of ascites was associated with portal obstruction and this is in part true in the cirrhosis. Ascites may occur in acute liver insufficiency and without any obstruction to the portal flow. As a rule edema is an associated finding under such conditions and is due to a general cellular disturbance, secondary to severe liver disease. The only known laboratory finding that helps us to explain such a phenomenon partially, is the inversion of the albumin-globulin ratio in the plasma, frequently with a lowering of the plasma protein.

With such a change in the osmotic pressure relationships in the blood, a movement of water into the tissues and serous cavities is a natural consequence. Additional factors favoring the production of edema are the possible increase in capillary permeability in liver disease and the deglycogenization of the liver itself. Adequate tests to measure accurately this control of the fluid movement in the body do not exist. A simple but approximate method exists, nevertheless, and I am going to emphasize it because of its simplicity. I refer to the measurement of fluid intake and urine output. Such measurements are obviously only moderately accurate as they are usually made by the average nurse or family. By a little insistence,

however, a satisfactory idea can be obtained of urinary activity as related to fluid intake. In patients who are seriously ill from hepatic failure one almost invariably finds an associated oliguria. The moment the balance swings toward a return to compensation in liver function the urinary output increases in amount and an obvious diuresis sets in. At times this diuresis is very striking, even in the absence of demonstrable edema or ascites. When it occurs it is extremely rare for the patient's symptoms not to improve, and for recovery not to take place. Because of the ease with which such observations can be made and because of the almost invariable favorable response when such a spontaneous diuresis occurs, I wish to urge the importance of making these determinations in cases of hepatic failure. In my experience they offer the simplest and best means of arriving at a prognosis in many cases.

Several other laboratory tests should be mentioned. Measurement of the serum phosphatase, as suggested by Ivy and others, is said to be of diagnostic value in differentiating the jaundice due to a mechanical block of the common duct and that due to intrahepatic disease of a toxic or infectious origin. In the former there seems to be little if any elevation of the serum phosphatase, in the latter the values reach rather high levels. If this is true, the performance of such a test may well justify itself in these very different groups. The Takata Ara test is one that has occasioned much comment in recent years. Essentially it is a flocculation test performed on the blood plasma with solutions of sodium carbonate and corrosive sublimate. It probably depends upon the already mentioned albumin-globulin changes in the blood for its findings. When positive it usually means advanced liver disease and it usually is positive in the Laennec type of cirrhosis. As a diagnostic procedure it is usually confirmatory only. Another method of diagnosing the presence of a portal type of cirrhosis is of more importance because of its clinical significance. I refer to the demonstration of esophageal varices by relief films of the esophagus. The obvious reason for making such an examination is usually the occurrence of an unexplained hematemesis. At times, however, portal cirrhosis may be present without any history of bloody vomit and varices may be demonstrated. When found they offer absolute proof of the diagnosis. In addition to its diagnostic significance it is also true that such a finding should be sufficient reason for giving a rather guarded prognosis.

Attempts to measure the capacity of the liver in relation to nitrogen metabolism are not particularly satisfactory. The estimation of amino acids in the blood in cases of severe failure may show an increase in these values, but only

tion to the use of large quantities of carbohydrate, were important in individual cases. In a few repeated transfusions seemed to be of real benefit and in extreme hepatic failure such a procedure must be included as an important form of treatment. Anemia, purpura, spontaneous bleeding and a low serum protein are the indications for its use. Diuretics were of little or no value during the period of acute liver insufficiency. Abdominal paracentesis was of symptomatic benefit only. In view of the previous remarks on the prognostic value of a spontaneous diuresis it is of interest to note that in nine instances out of forty-one such an event occurred. All but one of these nine patients recovered. Of the twelve patients who survived between 1930 and 1935, eight showed a striking diuresis.

In summary I should like to emphasize certain points. Aside from a few exceptional cases the diagnosis of liver disease can be made and reasonably well evaluated by careful clinical observation alone. Repeated laboratory procedures afford information of real value in determining the progress of a given case. As a rule single tests do not give outstanding diagnostic or prognostic information although they do give important confirmatory evidence of hepatic disease. The simple measurement of fluid intake and urine output in cases of real hepatic

sent to this statement not only for liver diseases but also for all diagnostic consideration in medicine. What is the reason for such a disappointment in evaluating laboratory tests?

I think the last generation of physicians brought up in a splendid spirit of experimental medicine has awaited unrealizable responses from the laboratory work.

There cannot be the test of undisturbed function in any organ. Especially the liver, composed of many units different in anatomic structure as well as in functional task, cannot be checked by one or two test tube reactions.

However, I would be wrong to minimize the value of chemical tests in favor of a refined clinical empiricism obtained by intuitive and careful bedside observations. The liver has five main functions—the katabolic and anabolic transformation in carbohydrate in protein and in fat metabolism, the metabolic changes and probably the synthesis in the sterol series that is cholesterol, bile acids and different vitamins and last but not least the excretory function in the bile.

In checking these different functions we add to our bedside observations not only confirming figures but obtaining very valuable hints concerning the special kind of liver disorder. We have used since our first publication ten years ago with greatest satisfaction the quantitative determination of cholesterol and cholesterol ester to counterbalance the question of obstruction and liver drainage in urgent surgical cases as well as in patients with chronic jaundice. Total cholesterol alone is not of great value. Only the consideration of total in the relation to free and cholesterol esters gives the right points of diagnostic importance.

#### DIAGNOSTIC SCHEME OF CHOLESTEROL—CHOLESTEROL ESTER VALUE IN LIVER DISORDERS\*

Total	Free	Esters	Ratio F E	
High	High	High	Normal	Jaundice without liver damage obstruction
High	High	Lowered	Changed	Jaundice with liver damage obstruction. Biliary cirrhosis
Normal	Normal	Lowered	Changed	Liver damage without obstruction Laennec annular cirrhosis
Low	Lowered	Very Low	Inverted Ratio Ester Crash	Acute yellow atrophy Severe toxic liver damage Last stage of Laennec's cirrhosis

failure frequently provides the necessary evidence for arriving at a prognosis.

Treatment in all cases of hepatic insufficiency, regardless of their severity or cause, should consist in intensive carbohydrate therapy with free use of the intravenous administration of glucose. An additional measure of importance consists in multiple transfusions. By prompt and energetic treatment many cases of hepatic failure, even when progressing to acute yellow atrophy, may be saved.

Besides the cholesterol and cholesterol ester we check the direct and indirect coupling bilirubin according to van den Bergh and we determine the blood ammonia. The first test shows whether the bilirubin present in jaundice results from an obstruction of a bile duct or from lesions of bile capillaries (not in direct bilirubin) or if the bilirubin results from an alternation of the excretory function of the liver cells (that is indirect bilirubin).

The so-called icteric index expresses only in figures what is to be seen qualitatively with our eyes. Icteric index is only a statement of the degree of jaundice not of the kind of jaundice and should not be supposed to be an equivalent for van den Bergh's test.

An increase of blood ammonia concentration which is present normally in the serum in a concentration of 0.02-0.04 mg. per cent as ammonium bicarbonate is due to a lack of urea synthesis. The function of urea synthesis in the liver is a vital necessity to detoxify the poisonous ammonia ion that results from the deamination of amino acids. An increase of ammonia ions in the serum is very harmful for the patient.

Considering the fact that the hepatic coma is probable this table is a part of Dr. Thannhauser's discussion.

CHAIRMAN SMITH: The discussion of Dr. Jones' paper will be opened by Dr. S. J. Thannhauser, Boston.

DR. S. J. THANNHAUSER, Boston: The concepts of liver disorders developed in a convincing manner by Dr. Chester Jones urge the idea of the greater value of clinical experience and judgment over any laboratory data concerning liver function. There is no doubt that every genuine physician will con-



particularly in the more chronic forms of liver disease. In the more acute forms of serious hepatic failure there is little doubt that repeated transfusions are of very great value and are indicated for at least three reasons: first, to combat existing anemia and to improve general tissue function; secondly, to provide a certain amount of normal serum protein; and thirdly, to control spontaneous bleeding. Recently the group at the Mayo Clinic has reported favorable results from oxygen therapy in patients suffering from profound liver failure, with improvement in an associated anoxemia or oxygen unsaturation. One other measure, abdominal paracentesis, is obviously indicated where the presence of ascitic fluid is causing symptoms of importance.

Any or all of the above measures may be employed in given cases. In patients suffering from real liver insufficiency from any cause the use of such means of therapy, if instituted with promptness and carried out thoroughly, will produce striking results. Cases previously considered hopeless may be treated successfully. In support of such a statement I should like to refer briefly to the results obtained in a series of fifty-six cases treated at the Massachusetts General Hospital in the past fourteen years. These cases were selected in the sense that all of them were cases of extreme liver insufficiency and all were deeply jaundiced. In many instances a diagnosis of acute yellow atrophy was made and substantiated by autopsy. So far as we can judge by clinical and laboratory methods, the individual cases did not vary in severity during the different years from 1922 to 1936. The group of cases includes patients with alcoholic cirrhosis, toxic cirrhosis, arsenical jaundice, cinchophen jaundice, severe sepsis, and a few without any known cause. There were a few patients with intense obstructive jaundice due to stone. In every instance the patient was thought to be most critically ill. The severity of the disease in these cases is suggested by the fact that ascites and peripheral edema were demonstrated in twenty-five patients. Purpura was present in seven. Bilateral hydrothorax, a rare physical finding, was noted in two. Laboratory data showed that one half of the patients had a serum bilirubin value of over 20 mg per 100 cc, and three-quarters of those tested had a dye retention of greater than 50 per cent at the end of one-half hour. Out of thirty-nine patients surviving long enough to permit stool examinations, seventeen showed positive tests for occult blood with gum guaiac.

By all clinical and laboratory standards the patients included in this group were most seriously ill from hepatic failure, due to one cause or another, and survival in each instance was problematical. It is of interest, therefore, to

examine the methods of treatment employed and the therapeutic results obtained. The group has been discussed in detail elsewhere and I will content myself with presenting the salient points.

From 1922 to 1925 inclusive, there were ten cases with nine deaths; from 1926 to 1929 inclusive, there were fourteen cases with fourteen deaths, or a mortality of 95 per cent during these eight years. During the years 1930 to 1935 inclusive, thirty-two additional cases were treated, of these twenty died, a mortality of 63 per cent. Inasmuch as many of the most severe cases were seen in the last period, it is important to determine the cause of such a striking drop in mortality. A study of the records shows that between 1922 and 1925 treatment consisted essentially in rest and the administration of a low fat diet. Glucose was administered by vein, subcutaneously or by rectum in small amounts on five occasions. Between 1926 and 1929 a diet designated as a high carbohydrate diet was ordered, and this diet contained a definitely higher carbohydrate content than the "low fat" diet. Glucose was administered rectally, subcutaneously, or by vein, in nine cases, but again in a very casual manner. From 1930 on all the patients were on a very high carbohydrate diet, which was planned to contain as near to 400 or 450 grams of carbohydrate as the patient could take. In many instances, patients were so ill that only a small proportion of the diet could be taken. In twenty-six of the thirty-two patients, prolonged and intensive intravenous glucose therapy was carried out, in some instances a continuous drip being employed for many days. The drop in mortality coincided exactly with this period of persistent and intensive glucose therapy. A study of the laboratory data indicated that the depth of the jaundice bore absolutely no relationship to the mortality, nor did those patients with a high dye retention fare worse than those showing apparently better liver function as measured by this method. Ascites and edema, while obviously serious findings, did not determine the outcome. Of fourteen patients with ascites and no intravenous glucose, thirteen died, only seven out of eleven patients with ascites died after receiving adequate intravenous glucose treatment. The mortality of those patients who received intravenous glucose in large amounts for three days or more was under 45 per cent. Regardless of the severity of the individual cases, survival took place with sufficient frequency in the presence of enthusiastic intravenous glucose therapy to leave but little room for doubt that such treatment was the determining factor in lowering mortality. In this group of cases, purpura alone seemed to be an absolutely bad prognostic sign. Other methods of treatment in addi-



tration has the further advantage of being applicable to either acidosis or alkalosis in such cases as the body is able to retain the ion needed and to excrete the other. The patient may thereby be spared the delay, and the physician the trouble, of actually determining whether acidosis or alkalosis has developed. If the persistence of vomiting prevents oral administration, equal parts of normal saline solution and 5 per cent glucose may be given parenterally. Advanced cases of deranged acid-base equilibrium, however, may lose their capacity for selective retention of the particular ion needed so that the oppositely charged but unneeded ion is also retained. In such cases the administration of a neutral salt like NaCl may fail to restore acid-base equilibrium. Here it may be necessary to determine by means of the  $\text{CO}_2$  combining power of the plasma the exact nature of the acid-base derangement and to direct therapy toward restoring the particular ion which individual sodium and chloride estimations of the plasma show to be deficient.

Prolonged diarrhea may rob the body of both sodium and chloride as well as fluid, and restitution must be made by oral or parenteral routes if dehydration and shock are to be avoided. Similar precautions are indicated if an enterostomy is allowing an escape of chlorides from the upper gastrointestinal tract. The normal organism attempts to balance its sodium chloride budget by reducing the renal output of salt. Before the extracellular fluids and the blood stream become seriously depleted of sodium and chloride, however, the urinary sodium chloride output will have fallen to zero. In these cases, as in heat cramps,<sup>10</sup> enough salt should be given orally or parenterally to secure a renal output of three grams of sodium chloride a day as this seems to represent an adequate margin of safety.

Talbott and Michelsen<sup>10</sup> have shown that heat cramps are due to "a loss of base chlorides and water from the body principally by way of the sweat glands without adequate replacement of the same." It is "essentially an occupational disease and an industrial hazard is created by the association of hard work, high external temperature, and profuse sweating." There is rapid amelioration of symptoms if the diminished concentration of chloride and base in the blood and body tissues is restored by the administration of sodium chloride. This may be given orally in doses of fifteen to twenty grams in the form of enteric coated tablets and in the severe cases 3000 cc hypodermoclyses of normal saline may be administered. Even more satisfactory is adequate prophylaxis which consists of administering sodium chloride in food, tablets and drinking water to workers exposed to high temperatures. An abundant sodium chloride intake is especially important during

the first few days. Subsequently after acclimatization, some compensatory mechanism comes into play whereby a more dilute sweat is secreted so that a salt intake of about fifteen grams a day will maintain sodium chloride equilibrium.<sup>11</sup> The mechanism underlying heat stroke is apparently quite different as prostration and death may occur before the acid base equilibrium is seriously disturbed and intravenous saline may actually make the convulsions worse.<sup>12</sup>

As long ago as 1874 Hilton Fagge<sup>13</sup> of Guy's Hospital London treated a case of diabetic coma by the intravenous injection of saline solution. This procedure was based on his recognition that the state of dehydration and collapse was essentially similar to that studied by O'Shaughnessy<sup>4</sup> in cholera. In diabetic acidosis base and water are lost through the kidneys along with the excretion of ketone bodies and glucose. Loeb and others<sup>14</sup> have shown that denial of insulin to a diabetic has no effect on water and electrolyte balance so long as no appreciable glycosuria develops. When followed by marked glycosuria, with or without ketosis, there is loss of water, sodium, potassium, and chlorine associated with loss of weight and nitrogen. Restoration of lost base and fluids by means of normal saline hypodermoclysis has now largely replaced the administration of alkalis in diabetic acidosis.<sup>15, 16</sup> Insulin and proper dietary regulation are of paramount importance in adjusting carbohydrate metabolism but the restoration of normal electrolyte balance depends on the administration of sodium chloride and water. There are a few clinicians, however, who prefer to supplement the insulin, carbohydrate therapy of diabetic acidosis with isotonic solutions of sodium lactate and Ringer's solution rather than with sodium chloride alone on the ground that the acidosis is thereby more quickly relieved.<sup>32</sup>

"The syndrome of salt loss dehydration and the resultant state of shock, typical of these disturbances is characterized clinically by progressive weakness and overwhelming prostration, nausea and vomiting, increasing pulse rate with falling blood pressure, subnormal temperature, sunken eyes and loss of the normal turgor of the subcutaneous tissues."<sup>17</sup> The recognition of the similarity of this syndrome to that of Addison's disease has guided the experiments which have demonstrated that insufficiency of the adrenal cortex results in an abnormal renal excretion of sodium and chloride. This leads eventually to such depletion of the body's supply of these electrolytes as to produce dehydration and its inevitable chain of consequences. Apparently the adrenal cortex serves as a regulator of sodium metabolism. Loeb further says:<sup>17</sup> "The most convincing evidence for the value of salt as a therapeutic measure in adrenal dis-

ably due to an ammonia poisoning resulting from a lack of urea synthesis, we must restrict the protein intake in patients with severe liver damage. High carbohydrate as Dr Jones already has emphasized, but very low protein is the advice to be followed in a liver diet.

CHAIRMAN SMITH Is there further discussion from the floor? If there is no discussion we will pass on to the next paper.

Dr Allen S Johnson has been busy with chloride metabolism, and I think he has some interesting observations to tell us. Dr Johnson

## SODIUM CHLORIDE THERAPY\*

BY ALLEN S JOHNSON, M D †

THE importance of sodium chloride, which makes up 0.17 per cent of the body weight expressed as  $\text{Cl}^1$ , has been somewhat overlooked in our present-day interest in the more complex molecules of the hormones and vitamins. The ancients recognized both its dietary and commercial importance and salt even entered into religious ceremony.<sup>2</sup> There is considerable evidence that the migrations of some primitive peoples, like those of various animals,<sup>1</sup> have been determined by the quest for salt deposits as well as for food and water. The medical student is well aware of the rôle of these electrolytes in the various physicochemical systems of the body, the practicing physician is likely to overlook the importance of sodium chloride balance in various disease processes. Sodium chloride therapy is concerned primarily with making good a sodium or chloride deficit in the body which has occurred because of an inadequate intake or an excessive loss of these ions. It should be constantly borne in mind, however, that sodium chloride does not exist as such in the body fluids but as sodium and chloride ions whose individual concentrations may vary independently of each other in various conditions. Loss of either of these electrolytes, to which tissue cells appear to be impermeable, results in disturbance of osmotic equilibrium existing between the interior and exterior of the cells. In an attempt to restore this balance extracellular fluid moves into the cell or is lost from the body. The result, then, of loss of these ions, especially Na, from the extracellular fluids, is a decrease in the total effective intracellular fluids themselves with the resulting clinical phenomenon of dehydration. In most of the disease states in which NaCl therapy is beneficial, the object is to combat dehydration by restoring the lost extracellular fluid as well as the deficient electrolyte.

Food supplies the normal intake of sodium and chloride which amounts to 10-15 grams a day.<sup>1</sup> With a constant salt intake over an appreciable period of time the normal human being loses an equal amount so that his salt budget remains balanced even though there may be abrupt changes in his output from day to day.

The kidney is the chief portal of excretion and appears to regulate the rate of output of sodium and chloride in order to maintain their normal concentrations in the extracellular fluids as well as in the blood plasma. There is a trifling loss of chlorides in the insensible perspiration but the sweat becomes an important vehicle of depletion only in the profuse sweating induced by hard physical work at high temperatures.<sup>3</sup> Except in severe diarrheas, like cholera and dysentery, no significant amount of salt is lost in the alvine discharges.<sup>1</sup> In these conditions, however, the resultant loss of sodium, chloride and water may progress to the point of profound shock described by O'Shaughnessy.<sup>4</sup> Finally, severe chloride depletion and dehydration may result from vomiting which removes large amounts of HCl from the stomach.

The collapse associated with acute intestinal obstruction was imperfectly understood until the experimental work of Haden and Orr<sup>5</sup> and of White and Bridge<sup>6</sup> showed that the dehydration resulted from the loss of fluids and especially chlorides by vomiting. The nature and origin of the hypothetical toxins responsible are still a matter of dispute but the importance of restoring lost chloride was well demonstrated by Hartwell et al.<sup>7</sup> and by Haden and Orr.<sup>8</sup> If parenteral saline is given in sufficient quantities to dogs with high intestinal obstruction, the usual period of survival is greatly lengthened even though the obstruction is not relieved. Today no competent surgeon would consider operating upon such a case without fortifying the patient with an abundance of sodium chloride by vein or by hypodermoclysis.

The same principles apply to vomiting due to other causes. It is important to remember, however, that the patient dehydrated by vomiting has lost acid rather than basic electrolytes. Ketone bodies may appear in the urine because exhaustion of glycogen reserves has caused an upset in normal fat metabolism, but, if the chloride loss is severe enough a state of alkalosis, not acidosis, may really exist as Drake, Marsh and Gamble<sup>9</sup> have shown. The recognition of alkalosis in the presence of ketosis is important. The administration of glucose will relieve the ketosis but sodium chloride not sodium bicarbonate, is needed to restore electrolyte balance. Sodium chloride adminis-

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the salt contained in the ordinary diet. Except in emergency parenteral saline is contraindicated as Wile<sup>31</sup> believes that the rapid elimination of bromine may cause damage to the kidneys.

During the past year I have been interested in a group of seventeen patients with a fatigue syndrome having certain points in common with the symptom complex often referred to as chronic exhaustion, nervous exhaustion, neurasthenia or neurocirculatory asthenia. The chief complaint common to all seventeen patients has been weakness and easy fatigability with a disinclination for physical activity especially if it involve sustained exertion. Most of them complained that they failed to feel refreshed even after a sound night's sleep and the males who have previously had athletic inclinations find that they can no longer "get into condition" by means of progressive graduated exercise. More than half of the patients have complained of increased nervousness and irritability although this symptom is more often appreciated in retrospect when the patient becomes aware of greater calm and poise after the institution of therapy. The onset is insidious and the duration difficult to define. The severity of the symptoms may vary from unusually slow recuperation from the fatigue of exercise to almost total incapacity for physical exertion. Pre-cordial pain, palpitation and sometimes definite exertion dyspnea may be experienced. Three quarters of the patients were in the twenties and thirties and there was a slight preponderance of females. None of them had any clinical evidence of coronary disease or other organic pathology and such metabolic readings as were obtained were normal. The pigmentation, hypotension, hemoconcentration and gastrointestinal disturbances of Addison's disease were absent. The one laboratory finding common to all these cases has been a low blood chloride level although there is no evident cause for this such as excessive chloride loss by any of the usual channels of excretion or an obviously deficient chloride intake. The significance of the low blood chlorides which are below 450 mg NaCl per 100 cc of whole blood, is obscure. An increase of two to six grams in the patient's daily sodium chloride intake is followed in four or five days by complete relief of the presenting symptoms. Conversely deprivation of this extra salt is followed after a like period of time by a reappearance of the symptoms. These observations have been carried out repeatedly on various patients in this group with identical results even when they were not warned what to expect. But in neither the salt administration phase nor in the deprivation phase is there a significant change in the blood chloride level. Observations on the chloride output of these cases have not been en-

tirely satisfactory as they were all ambulatory private patients but in general it may be said that sodium chloride therapy is attended by an increased urinary chloride output commensurate with the increased chloride intake. Usually a patient gains about two pounds of weight during the first fortnight of therapy but there is no further gain. The blood pressure remains unchanged. Unfortunately the sole criterion of successful therapy seems to be the subjective improvement reported by the patient. Nevertheless the seventeen patients in question have been relieved of their fatigue symptoms for periods varying from four months to one year by the simple expedient of increasing their salt intake. No relapse has been experienced except when salt deprivation was deliberately carried out. Low blood chlorides however cannot be regarded as the sole diagnostic criterion of this syndrome as they have been found in various constitutional disorders whose presenting symptom was fatigue. Among these may be mentioned cases with chronic infection, secondary anemia, coronary disease and schizophrenia. Such cases have not been benefited by salt therapy alone. It would appear that sodium chloride therapy is purely empirical in the fatigue syndrome described and it is indicated only in those cases of fatigue with hypochloremia and signs of neurocirculatory instability in which careful study fails to reveal any recognized constitutional disorder to account for the presenting symptoms.

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ease in man, as well as in the adrenalectomized animal, is found in the fact that the withdrawal of salt may induce acute adrenal insufficiency and that frequently the only therapeutic measure necessary to relieve it is the re-administration of sodium chloride. Nevertheless it should be recalled that salt alone will not maintain the normal sodium level in the blood or cause indefinite survival of the completely adrenalectomized animal. In other words, a certain amount of cortical substance, either formed within the body or introduced from without, is essential to life."

The value of sodium chloride therapy in pneumonia has been disputed ever since 1899 when Penrose<sup>18</sup> first reported beneficial results from its use. In 1913 Peabody<sup>19</sup> showed that prior to the crisis in lobar pneumonia the blood chlorides and urinary chlorides undergo a marked decrease. Haden<sup>20</sup> in 1927 reported benefit from sodium chloride administration in a small series of lobar pneumonias. Many observers who have interpreted these biochemical findings as an indication of chloride retention by the tissues sound a note of warning against such therapy for fear of producing serous effusions and edema, especially of the already congested lungs.<sup>21</sup> Sunderman's observations<sup>22</sup> have helped to reconcile these divergent opinions. Pneumonia is characterized not by a retention of chloride during the pre-critical period but by the body's diminished capacity to conserve chloride on a low intake of chloride and a diminished capacity to excrete excess chloride on a high chloride intake. The low blood and urinary chlorides before the crisis are apparently due to a deficient chloride intake associated with the anorexia of the patient. After the crisis the balance becomes restored as a result of an increased salt intake and the return of the kidney's capacity to adjust sodium chloride excretion to the needs of the body. The practical therapeutic conclusions to be drawn from these observations are uncertain. Wilder and Drake<sup>21</sup> advise giving children an amount of sodium chloride which will cause enough water retention to prevent weight loss. This is difficult to determine in the case of adults as few beds are mounted on scales. A middle course is probably the wise one at present. Salty broths may be given at frequent intervals in addition to the monotonous round of tap water and fruit juice which constitutes the usual saltless diet of the pneumonia patient. Intravenous drips of normal saline should probably be reserved for cases of impending dehydration or peripheral circulatory collapse where it is imperative to augment the volume of circulating fluid.<sup>23</sup>

The behavior of the blood chlorides in cutaneous burns has features in common with the phenomena observed in lobar pneumonia. The

period prior to the separation of the devitalized tissue resembles the precritical stage of pneumonia in that there is a lowered blood chloride level and a lessened urinary chloride output. The NPN is elevated in spite of an increased nitrogen output in the urine. The lowering of the blood chloride is proportional to the amount of tissue devitalized and cannot be attributed to loss of serum from denuded surfaces as it occurs even in the presence of a perfectly dry eschar. After separation of the devitalized tissue, even though there is a marked increase in serous oozing, the blood chloride rises to normal and there is a sudden outpouring of chlorides in the urine similar to the post-critical stage of pneumonia. Davidson<sup>24</sup> believes that retention of sodium chloride takes place in the body and concludes that the fall in the blood sodium chloride cannot be wholly explained by alteration of renal threshold, diet, fever, exudation, blood concentration, or vomiting. He recommends sodium chloride therapy, though its rationale is obscure, if retention already exists. All observers agree with Underhill and others,<sup>25</sup> however, that dehydration and blood concentration must be prevented. The tannic acid or gentian violet treatment of the burned area will produce a coagulum to prevent fluid loss. A high fluid intake is an important adjunct. If this is to be given parenterally, normal saline is of course indicated. If oral administration of fluid is to be relied upon, sufficient sodium chloride should be given with the diet to maintain a constant body weight, thereby insuring normal fluid retention by the tissue.

In 1922 Schlagintweit and Sielmann<sup>26</sup> observed a dilution of the blood and a lowering of the blood chloride level in patients suffering from x-ray intoxication following deep radiation therapy. Cameron and McMillan<sup>27</sup> did not find the blood chlorides invariably affected though they did observe a diminished chloride and increased nitrogen excretion in the urine. Both groups of investigators agreed that an increased sodium chloride intake would prevent or relieve the symptoms. At the present time radiologists appear to depend more on a liberal sugar intake for several days prior to radiation.

It has been known for a quarter of a century that chloride administration hastens the elimination of bromine and iodine from the body whereas chloride-poor foods slow this excretion.<sup>28</sup> Wile, Wright and Smith<sup>29</sup> were among the first to apply this biologic fact to the therapeutics of bromide intoxication. Since that time various investigators<sup>30</sup> have employed sodium chloride in the treatment of bromide intoxications and dermatoses. A nutritious, easily assimilated diet, rich in vitamins, is prescribed along with a high fluid intake. Ten grams of sodium chloride is given daily in addition to

fluids are concerned the parenteral administration of sodium chloride will provide an excess of chloride over sodium in terms of the requirements of increasing plasma and extracellular volumes where 13 times more sodium is required than chloride even when no acidosis is present. Physiologic saline alone or diluted with glucose may, therefore, accentuate the acidosis by an elevation of plasma chloride or drop in plasma sodium unless this relative excess chloride is promptly removed by the kidney. As any acidosis severe enough to require parenteral therapy is attended with such dehydration as to impair kidney function it is clear that the treatment of acidosis by parenteral physiologic saline may in the initial stages of such treatment accentuate the acidosis. Therefore in acidosis the administration of a solution of sodium bicarbonate or an oxidizable organic sodium salt is indicated at the beginning of hydration therapy if the best results are to be obtained. Where such a solution must be given parenterally as is usually the case if parenteral saline is being administered the use of sodium lactate is at the moment the most convenient and effective therapy. A solution of this salt is available in sterile ampoules which upon being diluted as prescribed can be injected intravenously, subcutaneously or intraperitoneally with the physiologic saline without causing irritation. By its use in conjunction with saline and glucose the acidosis and hyperpnea may be overcome in the initial stages of the treatment. The possibility of a chloride acidosis will be avoided and previous to the establishment of a kidney function capable of selectively excreting chloride and conserving base the kidney's attempt to excrete the excess chloride of the parenteral saline will not cause a wasteful loss of sodium in the urine.

Usually the differential diagnosis of alkalosis and acidosis can be made from the history including the character of the fluids administered to the patient and from the type of respirations. Occasionally an overwhelming toxemia may inhibit the compensatory hyperpnea of acidosis. When in doubt as to the presence of acidosis or alkalosis in a severely dehydrated patient the use of a solution containing sodium chloride plus sodium lactate in such amount as to make the absolute and relative concentrations of sodium and chloride those of plasma is far better therapy than the parenteral administration of physiologic saline. Since as well as the sterile ampoules of sodium lactate there are on the market sterile ampoules of saline plus sodium lactate in

proper proportions there is now available to all physicians a convenient and more effective parenteral fluid therapy for acidosis and dehydration than results from saline alone.

CHAIRMAN SMITH: Dr. Bock, would you like to say anything on this subject? If not I will ask if there is any further discussion?

DR. J. M. LOONEY, Worcester: Mr. Chairman—These very excellent papers which have been given to us on sodium chloride therapy lead one to believe that this subject is just beginning to come into the prominence which it deserves. The whole phase of sodium ions and chloride ions is not to be understood however without taking into account certain other ions of the body. A recent paper on the metabolism of sodium and potassium given at New York has indicated that probably this entire field of therapy is to be explained not from the loss of sodium chloride but from the changed ratio between potassium and sodium. Recent work has shown that totally adrenalectomized animals can be maintained indefinitely by giving sodium chloride and sodium citrate and that if these animals are given as little as half a gram of potassium, they can be thrown into very severe adrenal shock and death will result. The loss of sodium chloride in cases of heat exhaustion resembles that in cases of adrenal insufficiency and the cure by giving sodium chloride is undoubtedly due to the fact that the potassium of the body is maintained in the tissues of the cells whereas the sodium is predominant in the fluids. In these cases where fluid sodium is lost there results an overbalance of potassium and by giving sodium the potassium overbalance which undoubtedly seems to be the cause of the symptoms is overcome. One of the major functions of the adrenal gland appears to be that of regulating the balance between sodium and potassium which is necessary for the normal functioning of many physiologic functions.

CHAIRMAN SMITH: Is there further discussion from the floor?

Most of us want to be specialists or experts or something of that sort, but there are still a few men in medicine who are satisfied with a reputation of an outstanding general practitioner. Such a man is Dr. Sproull of Haverhill who will tell us the general practitioner's view on the treatment of angina pectoris. Dr. Sproull.

## A GENERAL PRACTITIONER'S VIEWS ON THE TREATMENT OF ANGINA PECTORIS\*

BY JOHN SPROULL, M.D.

I HAVE chosen the title of this paper, namely, "A General Practitioner's Views on the Treatment of Angina Pectoris" because I am a general practitioner and I am presuming that the larger part of this audience is composed of similar general practitioners. I propose to present to you today the approach to this problem and the details of treatment of this syndrome, angina pectoris, which I use in my daily work as a general practitioner of medicine in a suburban city of moderate sized population.

Some of the assertions I shall make you will immediately subscribe to because they will be in accord with your experiences; others you will accept because they appeal to your reason; and others still you will accept only tentatively, believing I hope in my veracity but not completely accepting these statements until such times as you have tested their accuracy in the crucible of experience, the daily practice of medicine.

At the outset certain postulates may be stated.

1. Angina pectoris is not a disease entity but a painful subjective syndrome associated with various pathologic alterations and functional

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CHAIRMAN SMITH The discussion of this paper will be opened by Dr Allan M Butler of Boston

DR ALLAN M BUTLER Boston Dr Johnson has called your attention to many of the conditions in which disturbances in the sodium and chloride balances and plasma concentrations indicate sodium chloride therapy. In discussing this subject I wish to emphasize one point. If one is to appraise adequately, and treat, disturbances in the metabolism of sodium and chloride these two substances must be considered as two dissociated oppositely charged ions  $\text{Na}^+$  and  $\text{Cl}^-$ , and not as a single substance, sodium chloride. Before sodium could be determined conveniently it frequently was the custom to report chloride values as so many grams of sodium chloride. Such data give no information concerning sodium or sodium chloride. Indeed one cannot determine the concentration of undissociated sodium chloride in plasma or body fluids because this does not occur. We determine concentrations of serum calcium and serum phosphorus not of serum tricalcium phosphate. The plasma sodium concentration is roughly 13 times that of the plasma chloride. On the other hand, the red blood cell chloride concentration is less than the plasma chloride concentration but roughly thirteen times its sodium concentration. In other tissues so far as our knowledge goes the absolute and relative concentrations of sodium and chloride are still different. Making deductions from the information derived from plasma the concentration of sodium or chloride in the body fluids may vary independently. To be sure if their relative plasma concentrations are altered a situation usually arises which results in the kidney excreting the one and conserving the other in such manner as to tend to re-establish their normal plasma concentration ratio

As a result of such a regulatory mechanism urine may be practically free of the one ion, while containing considerable amounts of the other. The stool concentrations of sodium and chloride are likewise unequal.

To illustrate the desirability of considering the separate distribution and metabolism of these two ions within the body, we will take two examples.

First, Dr Johnson has called your attention to his series of patients in whom he has observed a low blood chloride. The whole blood chloride concentration per unit volume of blood depends upon three factors: first, the concentration of chloride in the plasma; secondly, the concentration of chloride in the red blood cell; and thirdly, since concentrations in plasma and red cells are different, blood chloride concentration depends upon the volumes per cent of red blood cells. Hence whole blood chloride concentration varies with variation in the hematocrit even though plasma and red blood cell chloride concentrations remain normal. Therefore, Dr Johnson's observation raises certain questions. First, what is the plasma chloride concentration in these patients? Though an answer would give us a quantitative variation from the normal, alone it would not tell us much. Is there an associated acidosis or alkalosis? Is there an associated alteration in plasma sodium which affects the plasma bicarbonate as much as does the altered plasma chloride? Since the determinations of plasma sodium, pH and bicarbonate are today as simple as the determination of plasma chloride, these questions pertinent to an understanding of an observed low blood chloride can be readily answered. Possibly one would like to know the concentration of chloride in the red blood cells but present knowledge indicates that no helpful information would be derived therefrom.

The second example concerns the efficiency of the treatment of alkalosis and acidosis by the administration of parenteral physiologic saline. Dr Johnson has called your attention to the loss of chloride in excess of sodium in the vomiting of gastric secretions and the resultant alkalosis. As well as the chloride lost by the vomiting, the patient will have lost sodium in the urine, for, in the early phases of the vomiting before severe dehydration has set in, sodium will be excreted in the urine in an attempt to resist the alkalosis. Later when dehydration is severe, sodium will not be excreted in the urine even though the continued loss of gastric chloride produces a severe alkalosis. This is the situation when one resorts to parenteral physiologic saline therapy. In the saline solution the ratio of sodium to chloride is 1 to 1 whereas in plasma it is 13 to 1. Since physiologic saline has a sodium or chloride concentration equal to the plasma sodium (not chloride), the chloride concentration of physiologic saline is hypertonic to the plasma chloride. Thus at the beginning of hydration therapy when the kidneys are not functioning, physiologic saline is ideal since it provides chloride in excess of that required to balance the sodium and thus corrects the excessive chloride deficit and alkalosis. When the saline therapy has replaced the sodium deficit the body will be sufficiently hydrated to provide a blood and urine flow permitting adequate kidney function. If a chloride deficit still exists the kidney will then excrete a large amount of sodium in an alkaline urine without excreting chloride. Thus from start to finish in cases of this type the administration of physiologic saline plus glucose for the starvation ketosis, is as near perfect therapy as possible.

On the other hand if we have a patient who has a severe acidosis with loss of base, principally sodium so far as the blood plasma and extracellular



usually so successful that it is deemed necessary to urge the importance of its recognition.

The diagnostic clue observed in each case has been the patient's awareness for a period of time of varying duration of rapid beating of the heart before the onset of the angina and it is therefore advised as good practice to make direct questioning of all angina patients as to the occurrence of such rapid beating, for some patients will not offer such information believing it is of little importance compared with the description of their agonizing pain.

The anginal pain in this group may be of such severity and duration as to simulate coronary thrombosis and require large doses of morphia for its relief. Furthermore there may be associated coronary artery disease proved by electrocardiogram and yet the paroxysmal tachycardia and not (as usual) the coronary artery disease may be the initiating factor in the production of the attack of angina.

In such cases treatment directed toward the coronary artery disease may be of no avail, but if the presence of paroxysmal tachycardia as the causative agent be recognized, treatment directed to this condition may bring about complete cessation of the anginal attacks.

Group 2 The anginas associated with syphilis of the aorta constitute one of the two major groups, the other being group No. 1, namely, those associated with atherosclerosis of the coronary arteries or their branches.

It is difficult to estimate what percentage of anginas are related to aortic disease. There is considerable difference of opinion as to the incidence of syphilitic aortitis.

Some believe that aortitis is a comparatively rare disease and others that it is quite common. The reliability of general mortality statistics as to the frequency of occurrence of this disease may be justly questioned, and for the following reasons:

1 Syphilitic aortitis as a disease entity has no practical existence for most general practitioners unless accompanied by valvular disease or aneurysm and yet the disease occurs about twice as frequently without valvular involvement as with it, and also much more frequently without aneurysmal formation.

2 It is difficult, and many general practitioners are unable, to recognize any other than the most apparent regurgitant murmurs which accompany aortic valvular disease due to syphilis, and thus a great many cases with faint murmurs escape detection.

3 It is not the custom or habit of practitioners in general to make or have made serologic tests for syphilis even in cases of angina pectoris.

4 Autopsies to determine the cause of death are of infrequent occurrence outside of large

hospitals and many cases of syphilitic aortitis die with the disease wholly unrecognized.

5 Granting the recognition of syphilis of the aorta as the cause of death the stating of such a cause on death certificates makes for so many social difficulties like loss of insurance and disturbance of family relationship that some substitute other causes such as myocarditis, arteriosclerosis, or valvular disease of the heart. However, be the aforesaid statements true or false there is an admitted group of angina pectoris cases apparently causatively related to syphilis of the aorta. Several facts are worthy of note in this connection:

1 It is well known that syphilitic processes probably seldom if ever invade the coronary arteries per se.

2 It is equally well known that syphilis does show predilection for the first portion of the ascending aorta, the portion from which the coronary arteries arise.

3 Syphilitic involvement of this portion of the aorta does produce in some cases narrowing or closure of the opening or openings of one or both coronary arteries thus interfering with the nutritional blood supply to the heart, and such narrowing may be the result of syphilitic inflammatory exudation, gummatous formation or scarring of previously present syphilitic ulcerations.

4 Atherosclerosis of a coronary artery or its branches may occur coincidentally with, but not dependent on, the syphilitic aortitis and such atherosclerosis of the coronary artery rather than the coexistent syphilitic aortitis may be the cause of the anginal symptoms. It seems probable that such a combination of pathologic processes obtaining offers an explanation why antisypilitic medication fails to give relief in some cases of angina pectoris when serologic and other tests prove the existence of syphilitic aortitis.

The treatment of angina pectoris dependent on syphilis of the aorta is the treatment of syphilitic aortitis. It is advised however, that the treatment in this group of cases differs only from the largest of all groups, namely, those associated with atherosclerosis of the coronary arteries in the matter of drug treatment.

Because of the sovereign nature of the remedies we possess against syphilis the use of all other accessory measures is often relegated to the background or neglected entirely although the exhibition of these so-called accessory measures is just as much indicated in this group as in that group dependent on atherosclerosis of the coronary arteries. To state the matter fully while commending the use of anti-syphilitic medication, the modification of the patient's habits as to eating, drinking, muscular exertion, work, rest, and emotional dis-



disturbances of cardiac musculature and its nutritional circulation

2 The syndrome is of very common occurrence and its presence rather than the associated pathologic condition causes the patient to seek the aid of the practitioner of medicine

3 Because of its common occurrence the large majority of cases of angina pectoris come under the care of the general practitioner

4 As a corollary of the preceding postulates it follows that every general practitioner should have a clear conception of the methods of production of the syndrome and a comprehensive knowledge of the various pathologic conditions with which the syndrome is associated

5 An understanding of the associated pathologic and disturbed functional conditions should establish the basis for the formulation of the rational treatment of this common complaint

6 It would seem self-evident that, for a syndrome of such common occurrence, a preconcerted method of treatment based on an understanding of the altered anatomic and physiologic conditions should be possessed by every general practitioner

In practice a classification of the anginas according to the associated pathologic conditions has proved an excellent method of approach and the following classification which covers the various groups met with is suggested

Group 1 Those anginas associated with atherosclerosis of the coronary arteries or their branches This group may be termed the ordinary, everyday "garden" variety and embraces by far the largest number and is far and away, because of its great frequency, the most important

Group 2 Those associated with syphilis of the aorta

Group 3 The cases associated with disturbances of rhythm characterized by marked increase in the rate of the heart beat

Group 4 The anginas occurring with diseases of the blood, commonly severe anemia, but also the rarer disease polycythemia vera

Group 5 Comprises the cases associated with the therapeutic administration of insulin in patients with diabetes mellitus

This classification embraces practically all the cases which a general practitioner will be called upon to treat For clearness each group will be discussed separately and in reverse order to the positions assigned in the grouping

Group 5 The cases of angina pectoris associated with the therapeutic administration of insulin in cases of diabetes mellitus In these cases the production of the syndrome is probably dependent upon hypoglycemia caused by overdosage of the therapeutic agent The incidence of this group of anginas is not large

for the reason that the total number of cases of diabetes mellitus seen by a physician in general practice is small and but few of those who receive insulin develop angina pectoris The recognition of this group depends on estimations of the blood sugar and the treatment is clearly the regulation of the dosage of insulin to maintain a normal level for this blood element It is of importance, however, to realize that angina pectoris not dependent on hypoglycemia is of common occurrence in diabetic patients, more so probably than in the ordinary run of people of a similar age

It is asserted that atherosclerosis occurs with unusual frequency in individuals with this metabolic disease and that atherosclerosis of the coronary arteries is of equally common occurrence, and if this is so, it is clearly evident that angina pectoris is likely to be a common complication of diabetes mellitus and that its occurrence in patients with diabetes taking insulin is usually due to the associated coronary artery disease and not related to the administration of the therapeutic agent The occurrence of coronary artery disease being a causative factor in the production of anginas in this group explains why the cure or arrest of the diabetic process has no specially favorable influence on the angina other than that obtained by the reduction of obesity, a condition often found in diabetes

Group 4 The group associated with diseases of the blood includes the cases (not uncommon) occurring with severe anemia but also the rarer cases accompanying polycythemia vera The treatment for these anginas is evidently the treatment of the blood dyscrasia Polycythemia vera is not usually listed as a cause of angina pectoris but two cases of quite severe angina due to this cause have been observed personally, the latter one of the two dying of typical coronary thrombosis

Group 3 Those cases associated with and apparently causatively related to the presence of disturbances of the rhythm of the heart and chiefly the disturbances of rhythm characterized by marked increase in the rate of the heart beat are probably larger in number than is at present recognized Many practitioners are not aware of the existence of this group and yet its recognition is a matter of great importance, for the treatment is the treatment of the disturbance of rhythm (the causative factor) and differs fundamentally from the usual treatment of angina pectoris

Paroxysmal tachycardia has been the only disturbance of rhythm personally encountered as such a causative agent, although other disturbances of rhythm playing a similar rôle have been reported

The treatment of anginas in this group is

tion of the vital organ the heart, produced by an inadequate blood supply dependent on unalterable pathologic conditions in the structure of the affected arteries is the regulation of all that constitutes life for the individual who manifests the syndrome upon a level and at a rate in inverse ratio with the degree of inadequacy of the blood supply. That is to say, the greater the impairment of the blood supply the lower must be the level and the lesser the rate at which the affected individual should live. An appreciation of the foregoing statements and their implications should form the basis for the details of the rational treatment of this distressing syndrome. Furthermore while believing firmly in the efficacy of drugs as part of the treatment of the condition under consideration it would seem that the regulation of the patient's life upon the level and at the rate previously mentioned, can hardly be over-emphasized.

The details of treatment of this group of anginas will be considered under several headings

1 The treatment of the attack

2 The treatment between attacks consisting of measures directed toward lessening the frequency or diminishing the severity of the attacks, or both or, still more to be desired, the complete abolition of the attacks. The treatment of the attack is well standardized. In the early stages of disability, most attacks are dependent on unusual muscular exertion or unusual emotional stress.

A cessation of the causative muscular exertion by simple rest or removal of the cause of the emotional disturbance, will usually of itself give ready relief.

As the condition progresses, other measures are usually necessary. These other measures are so well known that it is only for the purpose of completeness they are mentioned.

1 Nitroglycerin in doses of 1-200 to 1-100 of a grain under the tongue usually gives prompt relief. It is better administered in the readily soluble tablets made for subcutaneous injection.

Many patients suffer considerable discomfort from the dosage of 1-100 of a grain and for these the dosage of 1-200 is probably better. Christian<sup>1</sup> suggests that as soon as the patient feels relief from his anginal pain the undissolved portion of the tablet be removed, thus lessening the headache and tinnitus and flushings from which many patients suffer when taking nitroglycerin.

2 Alcohol is at times valuable in giving relief from the acute attack. A swallow of undiluted whiskey or brandy is the method of choice for its administration.

3 If none of these measures prevail the subcutaneous administration of morphine sulphate in dosage sufficient to alleviate the evident suffering is indicated. Usually, but not always, one-fourth of a grain of morphine sulphate administered hypodermically will be adequate.

The latter method of giving relief should always be used reluctantly and with full appreciation of the truism that any case of angina pectoris of such severity or of such persistence as to require morphine for its relief is to be regarded as a probable case of coronary thrombosis until proved otherwise.

Comparatively few cases of angina pectoris require morphia for relief, while most cases of coronary thrombosis do. Many patients, however, by regulation of their lives by such measures and in such manner as will be indicated get such diminution in severity and lessening of the incidence of attacks that the aforementioned advised measures are seldom needed. Indeed it would seem right that this should be so, for while lacking experimental proof of the truth of the hypothesis it seems rational to believe that repeated insults to the cardiac musculature as endured in attacks of anginal pain must be harmful even if such attacks are brought to speedy terminations by the administration of nitroglycerin or other drugs.

Treatment between the attacks has for its purpose either the abolition of them or the alleviation of them either as to frequency of occurrence or as to severity or as to both and should be considered under several headings.

1 The attitude of the physician to and with the patient

2 The regulation of the patient's life considered under sub-headings

- a Work, exercise and rest
- b Obesity, diet and dietary habits
- c Emotional regulation
- d Miscellaneous

3 The use of drugs

1 The attitude of the physician to the patient should be one of hopefulness, truthfulness and calmness. Notwithstanding a full realization of the truth of the statement that any case of angina pectoris has within it the potentialities for coronary thrombosis, it is asserted that an attitude of confidence and hopefulness on the part of the physician not only as to prognosis about the duration of life, but also as to the results of rational treatment in most cases of angina pectoris is fully justified. Truthfulness on the part of the physician is absolutely essential to secure the full co operation of the patient in the re-ordering of his life which has proved to be so necessary. To adopt an attitude of secrecy or of deception, or to assume a funeral air of

tuibances is of great importance. These measures will be dealt with fully farther on in this presentation.

The drug treatment of syphilitic aortitis is comparatively well standardized and should consist in the exhibition of potassium iodide in large doses in conjunction with the administration of mercury or bismuth for a period of eight weeks, during which time no arsenicals should be administered.

The dosage and method of administration of the foregoing advised drugs are deemed important. The dosage of 75-150 grams of potassium iodide given in three divided doses after meals is deemed adequate. The initial dose is better large. The custom of beginning with small doses and increasing gradually is unnecessary and at times harmful.

The exhibition of mercury may be either by intramuscular injection or by inunction. A preference for the latter method has been the outcome of unfavorable results with the intramuscular injections.

The adequacy of the inunction method of administering mercury is unquestioned, while the inadequacy of some preparations advised for intramuscular injections of the same drug has been proved. Certainly no preparation or method of administration of this drug can be considered adequate unless the physician can by overdose produce evidence of mercurial intoxication. Measured by such standards, mercurial inunctions are potent and adequate and some preparations for intramuscular injection are decidedly lacking in efficiency.

Bismuth given by intramuscular injection is reported by some authorities as being more valuable than mercury in this disease, and yet it may not be denied that mercury adequately administered remains as ever a powerful anti-syphilitic medicament.

At the expiration of eight weeks' treatment with the aforementioned drugs, arsenicals may be usually administered with safety, provided the initial dose is small and that the dosage is very gradually increased to a level always some degree below that used in the treatment of syphilis in other parts of the human body.

Various arsenical preparations are available. The selection of any particular one is not part of this paper.

The rotation of a course of the preliminary drugs, potassium iodide and mercury, with a course of arsenicals may be continued for a year, after which treatment is probably better given intermittently with a considerable period of time between courses of treatment. Occasionally angina pectoris cases of this group will derive more benefit from the drugs advised in the atherosclerotic cases than from the so called anti-syphilitic drugs.

Group No 1 in this classification embraces those cases of angina pectoris associated with atherosclerosis of the coronary arteries or their branches and includes by far the largest number of anginas with which the practitioner has to deal. It may be termed the ordinary every day "garden" variety and probably represents about 85 per cent of all anginas met with in daily practice. Because of its frequency of occurrence a knowledge of the underlying pathologic conditions and the results ensuing therefrom is important.

Atherosclerosis of any artery produces a thickening of the vessel wall because of pathologic changes present principally in the subintimal tissues of the vessel affected, with a consequent narrowing of the lumen and loss of the normal elasticity of the vessel. In addition, the smooth endothelial lining of the blood vessel in part or in toto may be replaced by rough, irregular areas of atheromatous ulceration and subsequent calcification.

It will, therefore, be readily understood that such narrowing or obliteration of the lumen of a coronary artery, or of one or more of its main branches, whose function is to carry arterial blood to the heart muscle, must seriously interfere with the adequacy of the nutritional blood supply to the heart muscle and especially so when unusual muscular work or emotional stress makes unusual demands for increased blood supply to the heart, which increased blood supply cannot be furnished because of the inadequacy of the artery as the result of its diminished calibre due to the existing atherosclerosis.

In addition, the presence of roughening of the intima of the vessel as the result of atheroma or calcification, not only further impedes the flow of blood but also favors the formation of blood clot, thus facilitating the production of that serious disease, coronary thrombosis.

It may, therefore, be stated that the production of the syndrome angina pectoris in this group is dependent in the greater part on inadequate blood supply to the heart, dependent in turn on lessening of the lumen of the affected coronary artery or arteries. It may also be said that in the present state of medical knowledge there is no known method by which the arterial pathologic changes causing this inadequate blood supply can be altered. There is no known method of therapy which will cause any decrease in the atherosclerotic processes in the coronary arteries or their branches, or any enlargement of the lumen of such diseased arteries. A realization of the truth of this statement is important and necessary for the formulation of a plan of rational treatment for the syndrome angina pectoris.

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amounts to many, and even in small amounts to some, and knowledge of its evil and baneful influence in the peripheral vascular diseases, such as thromboangitis obliterans or as more familiarly known Buerger's disease, suggests that its use in angina pectoris cases is more likely to be harmful than beneficial and it is therefore probably better omitted.

The treatment of obesity is of great importance. There is probably no single therapeutic measure of such value in the treatment of angina pectoris as the reduction of obesity of marked degree and even in those slightly overweight the reduction to normal or slightly below normal often proves an important adjunct in treatment.

The methods employed in the treatment of obesity are of importance and vary somewhat with the age of the patient.

Thyroid extract has no place in the reduction of the obesity of the usual case of angina pectoris.

In patients under sixty-five years of age, the use of a strict antifat diet is indicated and it should be known that meats red, white or black are not contraindicated in angina pectoris as associated with atherosclerosis of the coronary arteries. Indeed in most people on a reduction diet the amount of protein should be definitely increased above the usual amount and better in the form of so called red meats, else many patients during the course of reduction will suffer from languor and muscular weakness.

A diet list should be given the patient stating clearly the names of the foods allowed and prohibited and also in approximate measures the amounts of the approved foods.

To dismiss the subject of diet by giving warning to patients to be careful in dietary matters is to presume a knowledge patients do not possess. The problem of the reduction of obesity in really elderly persons differs entirely from the so called younger group.

Very elderly people do not stand radical alterations of diet well. For some unexplained reason such changes in diet in very elderly people produce a condition of muscular and mental weakness and a diminution in energy resulting at times in such a degree of prostration as to cause the patient to become bedridden and in some cases even a fatal result may ensue from too radical changes.

In this class of cases the procedure advised is first, elimination of all fats from the diet for a period of two weeks, secondly, if this measure fails to cause steady loss of weight, reduction of the daily carbohydrate intake by twenty-five per cent is advised. In some cases the elimination of fats from the diet will result in a steady loss of weight, in other cases the additional measure of twenty-five per cent reduction of carbohydrate intake will be necessary.

However, if these two measures combined are not productive of a steady loss in weight, it is better to go no farther in the matter, for after all, moderate excessive weight in a slowly moving elderly person is not such a serious matter, and certainly not serious enough to justify such rigorous dietary restrictions as may occasionally produce a fatality.

(c) Emotional regulation. Disturbances of the emotions, although prime factors in the initiation and aggravation of angina pectoris, have not received the attention they merit and their rôle has not been sufficiently emphasized.

It is to be hoped that if this presentation makes no permanent impression on other phases of the subject matter under discussion, at least this part dealing with the disturbances of the emotions and their relationship to angina pectoris will not be readily forgotten.

It is not practical or necessary to particularize all of the various kinds of emotional disturbances which influence the course of angina pectoris, for obviously such disturbances must vary according to the nature of the individual and his environment.

Such conditions as worry about financial and business conditions, unsatisfactory domestic relationships, excessive joy, poignant grief or even pleasurable excitement are some of the common emotional disturbances. All these aforementioned emotional disturbances have been known to be factors of aggravation, and in patients in whom the response to treatment is disappointing, a searching examination which may have to include the most private parts of the patient's life should be made and will at times reveal some such cause as responsible for at least part of the anginal attacks or their unusual severity. Indeed, investigation into the business, financial, social and domestic life should be part of the examination of all cases.

Such conditions as worry over an erring son or daughter, unhappiness because of a nagging partner, fretting about disturbed family relationships, the excitement of card playing, with or without gambling, the reading of exciting literature, like the modern detective stories, the good-fellowship visits of boisterous friends, have all been aggravating factors in cases of angina pectoris.

Such emotional disturbances are of special importance in their relationship to nocturnal angina and it is of interest to note that such factors as mentioned are not always immediately operative, for it is known that the nocturnal angina may not appear until hours after the exciting cause has become latent. For instance, cases have been observed where for some reason frequent nocturnal anginal attacks occurred and the omission of the friendly game of bridge

wisdom, to give a deprecating shrug of the shoulders, to fail to answer questions or to refuse adequate explanations may well prevent the physician from ever doing the patient any good. Dismissing a patient with angina pectoris with a prescription for nitroglycerin tablets to be taken when the attack comes on, and an admonition not to work too hard and to be careful in dietary measures, is not adequate therapeutics. Furthermore, the physician who hopes to be successful in the treatment of angina should not discuss the diagnosis and outline the treatment for the condition except under such circumstances as will grant plenty of time, and freedom from interruption, and that usually means at a specially appointed period and probably never during a busy office hour.

The first interview after the presumed complete examination, which should have included history, physical examination and indicated laboratory work, will often make or unmake the success of the treatment, and it is then while discussing treatment that the physician should get en rapport with his patient and learn the minutiae of what constitutes life for that particular person and the regulation of which is of such vast importance. For these reasons there should be an absence of haste on the part of the physician, and in place of haste there should be calmness, interest and deliberation, all of which tend to inspire hope for the future and make for confidence in the physician by the patient.

The measure of how much work the patient may do or how much exercise may be indulged in, may be determined by how much is necessary to produce the attack, and advice should be given to keep the physical activities at most just below the level which usually precipitates the onset of the syndrome.

(a) Work exercise and rest. There are certain physical tasks, however, which are better prohibited and these include shoveling snow hurrying after trains or to keep appointments, digging or doing other laborious work in gardens or elsewhere putting on automobile tires and chains, walking up steep hills or up long stairs, walking through deep snow or against high winds. Indulging in contests or competition should be especially prohibited, for here, in addition to the physical factor, we have added the emotional urge.

Unusual physical strain, even for a short time may produce serious consequences especially in those who usually live sedentary lives. Fitzhugh and Hamilton<sup>2</sup> have shown that often unusual physical strain in those unaccustomed to it, precedes and probably bears an etiologic relationship to the onset of coronary thrombosis. It is a frequent story encountered in the middle-aged sedentary business man full of ambition on Saturday afternoon or Sunday morning,

issuing forth and clearing the snow away from pathways around his home, and experiencing as the result of such effort a mild attack of angina pectoris followed within twenty-four hours by a fatal or seriously disabling attack of coronary thrombosis. Other instances of similar unusual physical tasks producing like results are familiar to physicians.

Periods of complete rest are valuable to most angina patients, but few can afford them. To those whose need is imperative, a week or two in bed at the beginning of treatment is often of value. For those persons (and they are in the largest number) who must continue working, it is of great benefit to spend the week ends resting in bed or on a couch or just loafing around the home. Complete rest for fifteen minutes after each meal is valuable and easily carried out and it is usually possible for most patients to retire early and get rest in this manner. Special times and methods of resting will be suggested by the varying circumstances under which patients live and work.

(b) Diet, obesity and dietary habits. Probably no food per se ever induces angina pectoris and no special food should be prohibited other than those which are notoriously difficult of digestion and even then it is more of an individual peculiarity than the actual nature of the food which makes its prohibition necessary.

It is much more important to regulate the quantity than the quality of food. Many individuals may not readily digest corned beef and cabbage, but others may not readily take care of malted milk.

It is the duty of the physician to search out these idiosyncrasies of the patient. It may be stated that in a general sense any food may be eaten but that meals of large quantity, irrespective of their composition, are to be avoided. At times frequent small feedings are indicated, that is, five meals of moderate quantity rather than three taken to the sense of repletion.

Most patients find the truth of these statements for themselves, and many learn that tasks may be undertaken with impunity on an empty stomach which, if attempted after a full meal would almost surely bring on an attack of anginal pain.

Banqueting, even occasionally, should be tabooed, for it is well known that an orgy of eating or drinking is a common precedent of a disabling or even fatal coronary thrombosis.

Unless there is a special idiosyncrasy to them, tea and coffee are seldom harmful.

In very elderly people a small amount of whiskey before meals and at bedtime is often helpful in reducing the number of attacks.

Tobacco, however, should be used very sparingly or omitted entirely. It is harmful in large amounts to most everyone, in moderate



a day will render such patients somnolent enough so that the rest period follows as a matter of course

Codoin is a drug of superior merit in one class of cases and in one class only. In the elderly group of anginas with marked arteriosclerosis, with or without hypertension, the exhibition of codoin often results in almost complete abolition of the attacks. The picture of the elderly arteriosclerotic individual often very thin even to scrawny with or without hypertension usually showing enlargement of the heart and yet active and bustling about the business of life is a familiar one. Often such persons develop angina pectoris incident to carrying out tasks which previously were done with impunity. In such patients the administration of codoin one eighth of a gram four times a day is effective. After about ten days, the frequency of dosage may be reduced to twice a day and in some cases one-eighth of a gram once a day has been adequate. In a group of forty such cases followed for a considerable period thirty-six remained practically free from pain. In this same group alcohol in the form of whiskey, given in moderate doses before meals and in one larger dose at bedtime has seemed helpful. The retiring dose given as a "hot toddy" often ensures a night of sleep a desideratum not always easily obtained in elderly people.

c Many drugs have been lauded as capable of increasing the coronary circulation

In view of the permanent and probably progressive nature of the underlying organic pathologic changes present in atherosclerosis it would seem not unreasonable to doubt the power of any drug to increase the circulation through such an atherosclerosed coronary artery. It may be that the action of this class of drugs is not well understood for experience suggests their value in the treatment of angina.

A partial list of such drugs and combinations includes theobromine, theocaine, theominal, aminophyllin, theobromine sodium acetate, theobromine sodium salicylate. Which of the group one may use seems to depend in many cases on which glub salesman has recently interviewed the physician and detailed him with samples of his special drug and regaled him with fanciful tales of the efficacy of the salesman's particular preparation.

It seems true that a good part of the education of our profession in therapeutics is being received from the lips of interested salesmen representing various commercial firms rather than from the teachers in our medical schools and hospitals. Whether this state of affairs redounds to the glory of our profession and the advantage of our patients is problematical.

Among the previously listed coronary artery

dilators, theobromine sodium salicylate has seemed as effective as any and more so than some and it has been in use for many years in the treatment of angina pectoris. It is best given in ten to fifteen grain doses three times a day after eating and may be given in solution or in capsules. It is rather important to use the chemically pure drug.

Others of this same group of drugs may be tried and it appears at times as if alternation of two or more drugs is of value. Many of them however, cause disturbance of the stomach if given in adequate dosage, and this should be avoided.

Aminophyllin has lately come into popular vogue. Reisman<sup>4</sup> of the Beth Israel Hospital noted no benefit with the usual dose, one and a half grains three or four times a day, but did find it very useful in double such dosage. Certainly the experience of others is that with such dosage marked nausea is very commonly experienced. Quinidine sulphate has also been credited as being of value, but due to lack of personal experience in its use no opinion of its effectiveness is offered.

d The place of digitalis in the treatment of angina pectoris is important. Because it is the great remedy in cardiac disease, it is often administered in angina without indications for its use being present. It cannot be too strongly emphasized that routine digitalization of patients suffering with angina pectoris will result, in the very large majority of cases, in very marked increase in the number and also in the severity of attacks. This has been observed over and over again, and omission of the digitalis without any other measures being instituted has resulted in noticeable reduction in the number and the lessening of the severity of the attacks. Therefore, it should be apparent that digitalization of angina pectoris patients is not only a useless but may be a very harmful procedure. One may, therefore, establish the rule that by and large, angina pectoris patients should not be digitalized, but like many other rules in medicine there are exceptions. Occasionally maintained digitalization may be of great benefit to an angina pectoris patient even in the absence of evidence of congestive failure. When congestive failure ensues in a patient who previously has suffered from angina, the possibility of a silent coronary thrombosis must be given consideration. Digitalization of such a patient is indicated and may be a life-saving measure and furthermore, if after digitalization there occurs complete or marked reduction in the number of anginal attacks as contrasted with the period preceding the onset of congestive failure the presence of coronary thrombosis is almost certain. Apart from this group an occasional patient may be markedly benefited by digitalization, but no rule exists

in the evening or arguments and discussions between friends or the substitution of interesting but not exciting literature for the exciting variety has caused almost immediate cessation of the nocturnal attacks

In some cases which do not respond to treatment the keeping of a daily diary which gives the intimate details of the patient's life may reveal a constant sequence in time between a given activity and the onset of the anginal pain. No detail is too trivial to be excluded from such a diary and it should include hours of rest and sleep, work done, exercise taken, food eaten, conversations carried on, time given to literature and other pleasant diversions

#### (d) Miscellaneous

There are certain minor habits which should be talked over with the patient. Constipation with its consequent straining at stool is dangerous and should be corrected. Anginal patients have been known to die suddenly while straining out a constipated stool.

Exposure to excessive cold even without exercise is harmful. This statement may be verified by having an anginal patient step outdoors when the temperature is around zero and even without exercise a feeling of substernal oppression will usually result.

Sun baths have no beneficial influence on angina pectoris and exposure to the excessive heat of the sun is often harmful and especially so if work or exercise is carried on during exposure to noonday sun.

Sexual intercourse, because of its intensive mental and emotional strain, is usually better omitted. The drinking of large amounts of fluid at one time is inadvisable. The patient should be instructed to take his daily fluid supply in frequent small or moderate quantities and between meals rather than with meals.

All patients with angina pectoris should be instructed that if, at any time, the anginal attack is unusually severe or long lasting and is not relieved by the usual measures, removal to the home or the hospital in the manner involving the least muscular effort is indicated and the patient should go immediately to bed and send for the doctor and the patient should also know that indigestion is not an adequate explanation of the persistence or severity of the pain.

The drug treatment between the attacks will be considered under several headings:

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b Drugs of sedation, especially bromides, phenobarbital, codein and alcohol.

c Drugs supposed to increase the coronary

circulation as theobromine sodium salicylate, aminophyllin, and theocalcin.

#### d Digitalis

a Many drugs have been used and advised in the treatment of angina pectoris. Various opinions exist regarding the value of drug treatment and also as to the relative value of the different drugs employed.

It may be stated without fear of contradiction that no one drug is invariably beneficial. The syndrome being a subjective one, the effect of any medication has largely to be judged by the statements of the patients as to the severity and frequency of the attacks while taking a certain drug as compared with a like period during which no drug or some other drug was employed.

It is difficult at times to separate the beneficial effects derived from the reordering of the patient's life from those credited to special medication.

Notwithstanding all this difficulty, drug treatment is still employed and in some cases has seemed to prove of considerable value. Nitroglycerin given frequently during the day has been advised as a prophylactic against attacks. There is some variation of opinions as to its efficacy. Recently Brown<sup>3</sup> of the Beth Israel Hospital in Boston reported excellent results with this drug in the dosage of 1-500 of a grain given hourly during the day. The reported results warrant further trial of this method of administration.

Sodium nitrite and erythrol tetranitrate have not seemed efficacious and the disagreeable symptoms attendant upon their exhibition militate against their extended use. Headaches, tinnitus, disagreeable flushings, nausea and faintness have frequently accompanied their use.

Potassium iodide has not seemed of value except when treating angina associated with syphilitic aortitis.

b Drugs of sedation are usually of great value. Before the introduction of phenobarbital the various bromides were largely used and their value was and is often noted. The introduction of phenobarbital in the treatment of angina pectoris marked a distinct advance and there is no doubt that in the majority of cases of angina pectoris its exhibition is one of the most beneficial of all drug measures. The drug may be employed in various dosages but usually one-half a grain four times a day until sedation is obtained is adequate and then a maintenance dosage of half a grain twice a day will prove sufficient.

At times in refractory patients who could but will not take an adequate period of rest, the administration of phenobarbital in dosage of one and a half grains three or four times

a day will render such patients somnolent enough so that the rest period follows as a matter of course

Codem is a drug of superior merit in one class of cases and in one class only. In the elderly group of anginas with marked arteriosclerosis, with or without hypertension the exhibition of codein often results in almost complete abolition of the attacks. The picture of the elderly arteriosclerotic individual often very thin even to scrawniness with or without hypertension, usually showing enlargement of the heart and yet active and bustling about the business of life is a familiar one. Often such persons develop angina pectoris incident to carrying out tasks which previously were done with impunity. In such patients the administration of codein one-eighth of a grain four times a day is effective. After about ten days, the frequency of dosage may be reduced to twice a day and in some cases one-eighth of a grain once a day has been adequate. In a group of forty such cases followed for a considerable period thirty-six remained practically free from pain. In this same group alcohol in the form of whiskey, given in moderate doses before meals and in one larger dose at bedtime, has seemed helpful. The retiring dose given as a "hot toddy" often ensures a night of sleep a desideratum not always easily obtained in elderly people.

c Many drugs have been lauded as capable of increasing the coronary circulation.

In view of the permanent and probably progressive nature of the underlying organic pathologic changes present in atherosclerosis it would seem not unreasonable to doubt the power of any drug to increase the circulation through such an atherosclerosed coronary artery. It may be that the action of this class of drugs is not well understood for experience suggests their value in the treatment of angina.

A partial list of such drugs and combinations includes theobromine, theocaine, theonine, aminophyllin, theobromine sodium acetate, theobromine sodium salicylate. Which of the group one may use seems to depend in many cases on which glyb salesman has recently interviewed the physician and detailed him with samples of his special drug and regaled him with fanciful tales of the efficacy of the salesman's particular preparation.

It seems true that a good part of the education of our profession in therapeutics is being received from the lips of interested salesmen representing various commercial firms rather than from the teachers in our medical schools and hospitals. Whether this state of affairs redounds to the glory of our profession and the advantage of our patients is problematical.

Among the previously listed coronary artery

dilators, theobromine sodium salicylate has seemed as effective as any and more so than some and it has been in use for many years in the treatment of angina pectoris. It is best given in ten to fifteen grain doses three times a day after eating and may be given in solution or in capsules. It is rather important to use the chemically pure drug.

Others of this same group of drugs may be tried and it appears at times as if alternation of two or more drugs is of value. Many of them however, cause disturbance of the stomach if given in adequate dosage, and this should be avoided.

Aminophyllin has lately come into popular vogue. Reisman<sup>4</sup> of the Beth Israel Hospital noted no benefit with the usual dose, one and a half grains three or four times a day, but did find it very useful in double such dosage. Certainly the experience of others is that with such dosage marked nausea is very commonly experienced. Quinidine sulphate has also been credited as being of value, but due to lack of personal experience in its use no opinion of its effectiveness is offered.

d The place of digitalis in the treatment of angina pectoris is important. Because it is the great remedy in cardiac disease, it is often administered in angina without indications for its use being present. It cannot be too strongly emphasized that routine digitalization of patients suffering with angina pectoris will result, in the very large majority of cases, in very marked increase in the number and also in the severity of attacks. This has been observed over and over again, and omission of the digitalis without any other measures being instituted has resulted in noticeable reduction in the number and the lessening of the severity of the attacks. Therefore, it should be apparent that digitalization of angina pectoris patients is not only a useless but may be a very harmful procedure. One may, therefore, establish the rule that, by and large angina pectoris patients should not be digitalized, but like many other rules in medicine there are exceptions. Occasionally maintained digitalization may be of great benefit to an angina pectoris patient even in the absence of evidence of congestive failure. When congestive failure ensues in a patient who previously has suffered from angina, the possibility of a silent coronary thrombosis must be given consideration. Digitalization of such a patient is indicated and may be a life-saving measure and furthermore, if after digitalization there occurs complete or marked reduction in the number of anginal attacks as contrasted with the period preceding the onset of congestive failure the presence of coronary thrombosis is almost certain. Apart from this group an occasional patient may be markedly benefited by digitalization, but no rule exists

in the evening or arguments and discussions between friends or the substitution of interesting but not exciting literature for the exciting variety has caused almost immediate cessation of the nocturnal attacks

In some cases which do not respond to treatment the keeping of a daily diary which gives the intimate details of the patient's life may reveal a constant sequence in time between a given activity and the onset of the anginal pain. No detail is too trivial to be excluded from such a diary and it should include hours of rest and sleep, work done, exercise taken, food eaten, conversations carried on, time given to literature and other pleasant diversions

#### (d) Miscellaneous

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## MEDICAL PROGRESS

PROGRESS IN THE SURGERY OF THE AUTONOMIC  
NERVOUS SYSTEM IN 1935\*

BY JAMES C WHITE M D †

## I ANATOMY AND PHYSIOLOGY

AS indicated in last year's review of progress<sup>1</sup> in this branch of neurology,<sup>1</sup> recent work has pointed with increasing emphasis to the regulation of the autonomic nervous system by groups of cells in the central grey matter along the sylvian aqueduct and in the hypothalamus. These nuclei constitute the central ganglia which control the automatic adaptations of the viscera to the external environment. They in turn are subject to a certain degree of cortical control from cells in the premotor area (Area 6 of Brodmann). Beattie<sup>2</sup> has written an excellent review of these investigations. There is evidence that at least three groups of efferent fibres arise from the hypothalamic nuclei. One group arises in the supra optic area of the hypothalamus and apparently innervates the posterior and intermediate lobes of the pituitary gland, a second group from some or all of these anterior nuclei and a third from the posterior hypothalamus enter the brain stem and the spinal cord. These are the origin of the craniosacral (parasympathetic) and thoracolumbar (sympathetic) systems. According to Beattie the hypothalamus must be regarded as the mechanism which controls the autonomic nervous system and perhaps many of the endocrine glands.

After further investigation along these lines, Ranson, Kabat, and Magoun,<sup>3, 4</sup> have reported their results in stimulating discrete areas of the hypothalamus in the cat with the Horsley-Clarke stereotaxic instrument. Hypothalamic stimulation often produced a picture of intense emotional excitement, with dilation of the pupils and erection of the hairs, as well as acceleration of pulse and respiration, and a rise in blood pressure. Fluoroscopic observation after a barium meal demonstrated immediate inhibition of peristalsis. Stimulation anterior to this area, in the region surrounding the anterior commissure, the septum and preoptic area, caused contraction of the bladder, inhibition of respiration, and occasionally a drop in blood pressure but no single centre was found to give rise to a generalized parasympathetic discharge. This lack of a single centre is not surprising in view of the discrete nature of the parasympa-

thetic discharge. One does not for instance, expect the pupil to constrict when the bladder contracts, whereas when the sympathetic system is aroused the entire visceral activity is influenced. These observers could not support the view held by Beattie that the tuber cinereum has parasympathetic functions, nor could they discover a sleep centre in the hypothalamus as formerly described by Hess.

Davis, Cleveland, and Ingram<sup>5</sup> have done much to clear up the confusion which exists concerning the hypothalamic pituitary mechanism. There is as is generally known, the closest possible relation between these two structures. Topographically, they lie close together connected by the infundibulum. As pointed out above, a clearly demarcated group of nerve fibres (*tractus hypothalamico-hypophysicus*) links the two areas and it has also been suggested that there is a direct escape of secretion from the neurohypophysis into the third ventricle. When a tumor or experimental lesion is situated in one of these areas, the other is usually involved as well. It is therefore not surprising that the greatest confusion has existed as to which functions properly belong to the hypothalamus and which to the hypophysis. By using the Horsley-Clarke stereotaxic instrument these investigators were able to place accurate bilateral lesions in the hypothalamus without the possibility of injury to the pituitary. They found that under these circumstances complete resection of the pancreas is no longer followed by diabetes mellitus. Houssay and Basotti had previously shown that excision of the pituitary and the elimination of its diabetogenic anterior lobe hormone produced a similar effect. Such lesions in the hypothalamus must interrupt the descending nerve fibres from the ventromedial hypothalamic nucleus. When this pathway has been transected stimulation of the superior cervical sympathetic ganglia no longer produces hyperglycemia and glycosuria. It would therefore appear that the hypothalamus exerts a nervous control over the anterior lobe of the pituitary which is important in the regulation of carbohydrate metabolism.

An interesting insight into the control of the hypothalamus over the neurogenic-endocrine mechanisms is obtained from a case report of an angioma situated in the floor of the third ventricle, given by Davison and Selby.<sup>6</sup> They attribute the polydipsia and polyuria to the

From the Surgical Services of the Massachusetts General Hospital.

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which indicates the selection of such a case prior to the use of the drug and so it may be stated that if an angina pectoris patient fails to respond to the usual methods of therapy, digitalization as an experimental measure should be used. Furthermore, the fact that the patient perhaps in previous years suffered aggravation of the angina from digitalization does not necessarily prohibit its use in later stages of the disease, for occasionally a patient exhibits an aggravation from the drug at an early stage, and yet a few years later may show benefit from its use.

## COMMENT

A plan for the rational treatment of angina pectoris has been presented. This is based on a knowledge of the associated pathologic changes in the coronary arterial system, and the accompanying physiologic disturbances of cardiac musculature. It is admitted that its initiation is a time-consuming procedure but so are almost all efforts of merit. Lack of time or press of business is not an adequate excuse for failure to use it, provided the method suggested is proved to be helpful and correct. One would not accept such an excuse from a surgeon for performing an operation in a slipshod or incomplete manner. Surely the sufferings of the patient with angina pectoris are no less appealing, nor is the life of the patient with this affliction of less value than that of one ill with any of the so-called surgical diseases.

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CHAIRMAN SMITH: This paper will be discussed by Dr. Laurence D. Chapin of Springfield.

DR. LAURENCE D. CHAPIN, Springfield: *Mr. Chairman, Ladies and Gentlemen*—The hour is late. The seats are getting hard. My discussion will be brief. I have read and listened to Dr. Sproull's paper with much interest. He knows the art as well as the science of medicine. A great many cases of angina pectoris come under the care of the general practitioner and it is most important that he thorough-

ly understand the underlying pathology—arteriosclerosis, syphilis, diabetes anemia and so forth. Thanks to the postgraduate courses offered by this Society, the activities of the New England Heart Association and other aids, the average practitioner in Massachusetts does know his coronary pathology, which is the basis of successful treatment.

Dr. Sproull has limited himself this afternoon to a discussion of the anginas associated with arteriosclerosis of the coronary arteries or their branches. Much of what he has written sounds familiar in my experience and no doubt in yours. Nothing very new has developed in the treatment of angina pectoris during the past year. The reader has emphasized some of the old ideas—the avoidance of muscular strain, stairs and hills, high winds, cold air, snowdrifts, changing tires, hurried eating, exercise after meals, and so forth. Doctors subject to angina pectoris are doing these things every day. We can not always practice what we preach.

The nitrites, the barbitals, the theophyllins are dependable. So are rest periods during the day, especially after eating. Absolute bed rest is essential if the attacks are coming too often. If this fails to relieve, total thyroidectomy is to be considered. It has given great relief in anginal failure.

The diet problem is really a very simple one. Avoid indigestion, treating each case individually. Eat slowly, eat small meals, never overeat. Dr. Sproull stresses the importance of reducing weight in obese anginal cases. I like his method—low fat, moderate protein. If this restriction is not sufficient, reduce the carbohydrates 25 per cent, but go no farther. Most of these cases are over fifty years of age and I have certainly seen harm done to the heart by cutting down carbohydrates too much.

Emotional regulation is most important. Dr. Sproull says the physician must be hopeful, truthful, calm. I would add tactful. To one patient he would not think of suggesting the possibility of coronary occlusion and perhaps later rupture of the heart, while another patient would be intrigued by a careful description of myocardial infarction and necrosis. Then too, the doctor should not interfere too much with his patient's life. The latter, thoroughly warned, may choose to step out deliberately into the danger zone and it is his privilege to do so.

Here are a few sample admonitions which I give to angina pectoris cases:

If your bridge partner doesn't raise your demand, bid, admire her corsage.

If your daughter is out on a blind date, take a grain and a half of phenobarbital.

When a member of an opposing political party is on the air, turn off the radio.

When your tax bill comes in, be nonchalant—light a cigarette.

CHAIRMAN SMITH: Is there further discussion of the paper? If not and if there is nothing further to come before the meeting, I will declare it adjourned.

[Adjourned at 5:20 p. m.]

leviating the pain and limiting the extent of gangrene of the extremities. There were 14 cases of senile gangrene. Peri-arterial neurectomy of the femoral artery relieved the pain in 8 cases, the spread of gangrene was arrested in 7, and in only 7 cases was a major amputation required. Six cases of diabetic gangrene were reported. Pain was relieved after peri-arterial neurectomy of the femoral artery in every case, the gangrenous process was arrested in 4, and in only 2 was a major amputation necessary. Whatever the explanation may be, there seems to be no doubt that this operation is of real value as a palliative measure in this painful complaint when the only alternative treatment is amputation.

In the Peripheral Vascular Clinic at the Massachusetts General Hospital this operation has seldom been used in recent years. The reason for this is that it has seemed more logical to crush the peripheral nerves in the lower leg for the relief of pain in cases of gangrene. This procedure can be counted on to give complete interruption of pain for several months which is not uniformly true of periarterial sympathectomy. Crushing the peripheral nerves can also be counted on to produce a maximal vasodilation for over a month, which is far in excess of the transitory response which follows the periarterial operation. The results of crushing the peripheral nerves in forty-five cases of painful gangrene of the lower extremity have been reviewed recently by Smithwick and White.<sup>15</sup>

### III EFFECTS OF SYMPATHECTOMY ON THE CIRCULATION

The clinical importance of adrenalin and other chemical mediators in bringing about recurrent constriction of fully denervated arteries was mentioned in last year's review. Wright, Mulholland, McCloskey and CoTui,<sup>16</sup> have shown that the local vasoconstrictor effect of adrenalin injected under the skin in the sympathectomized leg of a dog is so intense that necrosis of the skin results. They warn against the danger of injecting this drug in the sensitized human extremity after sympathectomy. White<sup>17</sup> has pointed out that the satisfactory and lasting increase in blood flow which follows lumbar ganglionectomy and the far less effective results from the cervicothoracic operation can be explained by the portion of the peripheral sympathetic system which degenerates. Hampel<sup>18</sup> has studied the degree of adrenalin sensitization which results after degeneration of the pre- and the postganglionic set of neurones. In his experiments on the nictitating membrane of the cat he showed that the sensitization to adrenalin which develops is two- to threefold greater after postganglionic degeneration. White called at-

tention to the classical investigation of Langley which demonstrated that the preganglionic neurones for the arm originate in the lateral horn of the spinal cord (from the second or third to the tenth thoracic segments), traverse the anterior spinal roots and reach the sympathetic chain over the white rami communicantes. They then run upward to terminate in the highest thoracic and lower cervical ganglia. For the lower leg and foot they originate in the ninth thoracic to second lumbar segments and run down through the lumbar ganglia to terminate in the lowest lumbar and upper three sacral ganglia. The postganglionic neurone cells are situated at the terminations of the preganglionic fibres and reach the brachial and lumbosacral plexuses over the grey rami communicantes. They are then distributed to the blood vessels of the arm and leg by the peripheral nerves. It is therefore evident that resection of the second and third lumbar ganglia causes a degeneration limited to the preganglionic neurones which mediate vasoconstriction in the foot, since the postganglionic neurones to the sciatic nerve originate at lower segments. In the upper extremity, however, resection of the inferior cervical and upper two thoracic ganglia results in the degeneration of the entire postganglionic network. As a result of these two physiologically different operations, sensitization to adrenalin is maximal in the hand, minimal in the foot.

Clinically this offers a satisfactory explanation for the mediocre and the excellent results after the standard operations which have been developed in the past thirteen years for Raynaud's disease of the upper and lower extremities respectively. The experimental observations on which this theory is based have been thoroughly confirmed by Grant.<sup>19</sup> Modification of the technique for upper extremity sympathectomy to interrupt only the preganglionic portion of the peripheral vasoconstrictor pathway by Smithwick at the Massachusetts General Hospital and by Telford<sup>20</sup> in England is resulting in a striking clinical improvement. After this more physiological type of operation it is no longer possible to induce postoperative cyanosis in the hands by exposure to cold or nervousness, and the results up to a year and a half have been as good as those commonly seen in the lower extremity.

The clinical results of sympathectomy in England for vasospastic disorders have been summarized by Ross.<sup>21</sup> Reviewing the results submitted to him by the Fellows of the British Association of Surgeons, he found that—

In Raynaud's disease (sixty-one cases), cervicothoracic ganglionectomy produced "a great diminution in the frequency and severity of attacks, but not complete absence of attacks" in thirty cases. When the condition was present in a severe form and complicated by sclero-



partial destruction of the paraventricular and supra-optic nuclei. The extreme subnormal temperature, which averaged between 90.6° and 96° for the last three months of life, is ascribed to extensive implication of the tuber nuclei and the mammillary bodies. There is now a considerable and convincing body of evidence to show that temperature control is a function of the hypothalamus. This patient also had a low basal metabolic rate, adiposogenital dystrophy, and hypersomnia. The pituitary gland was not involved.

Experimental hypothalamic lesions in seven-teen monkeys reported by Watts and Fulton,<sup>7</sup> involving the supra-optic, tuber, and paraventricular nuclei, resulted in very similar symptoms of drowsiness and adiposity, as well as cardiac and gastrointestinal disturbances. The latter, reported by Hoff and Sheehan,<sup>8</sup> consisted of multiple hemorrhagic erosions in the gastric mucosa in five animals. There was evidence of dilation and atony of the stomach, suggesting sympathetic overactivity. In all of these animals the lesion was confined to the tuberal nuclei.

Evidence that the premotor cortex (Area 6 of Brodmann) inhibits overactivity of the hypothalamic centers has been brought forward by experimental work in the Laboratory of Physiology at Yale. Watts<sup>9</sup> found that faradic stimulation of many portions of the premotor area (especially the superior precentral sulcus) led to an increase in intestinal peristalsis. At times this became so active that intussusceptions were produced. In some of these experiments gastric secretion was increased. It was observed that bilateral vagotomy abolished most of the cortical responses. Watts and Fulton<sup>10</sup> also observed intussusception with fatal obstruction in three healthy monkeys in which the premotor area had been resected on both sides. In their experience this has never occurred following experimental lesions in other areas of the brain. They conclude that the cerebral cortex contains autonomic representation for the gastrointestinal tract which is largely restricted anatomically to the premotor area, and that this representation includes both excitatory and inhibitory components. Cortical representation of gastrointestinal activity may well explain the nausea and epigastric aura which are sometimes noticed at the onset of an epileptic attack. Cases of morbid hunger in tumors of the frontal lobes are also explainable on this basis.

Another autonomic function which has its highest representation in the premotor area is the control of body temperature. Kennard<sup>11</sup> has shown that a lesion limited to this area in the higher apes results in a lowering of surface temperature and diminished secretion of sweat.

change results from cortical extirpations in other areas. This fall in temperature is due to an alteration in the mechanism of reflex vasodilation, since a lag in the reflex vasodilator response is noted when the animal is subjected to a rise in environmental temperature.

## II OPERATIVE METHODS

The original Royle modification of the kidney incision for resection of the lumbar sympathetic chain leaves little to be desired in its respect for anatomical structures. In children or women of delicate build it permits a most satisfactory exposure of the lumbar sympathetic chain, but in obese or heavily muscled adults it is often entirely inadequate. Since the extraperitoneal approach is both a safeguard and results in a far easier convalescence than the transperitoneal route, it should be used when a unilateral lumbar sympathectomy is to be performed. Two recent suggestions have been made to improve the exposure, both of which have overcome the difficulties of resecting the chain in the short, stocky type of individual. Harris<sup>12</sup> has used a transverse abdominal incision from the quadratus lumborum to the edge of the rectus sheath, cutting the oblique and transverse abdominal muscles straight across. Flothow<sup>13</sup> recommends a slightly oblique, muscle splitting incision at the level of the umbilicus, extending from the edge of the rectus to the quadratus lumborum muscle in the flank. The patient is placed with the side to be operated on elevated 30 to 45 degrees. The three layers of the abdominal muscles are then separated in the plane of their fibres and the peritoneum, ureter, and the abdominal contents retracted toward the midline. This gives a direct exposure of the medial edge of the psoas muscle and the sympathetic ganglionated chain which lies at the edge of the aorta or vena cava. Flothow states that the exposure is adequate for removal of the entire lumbar chain and that it is superior to any heretofore described because it permits a rapid removal of the sympathetic trunk and is without danger of hernia formation. There have been over 100 cases operated upon by the extraperitoneal approach in Flothow's clinic without a single death.

In a review of the results of sympathetic neurosurgery in England, Ross<sup>14</sup> brings up again the much debated problem of periarterial sympathectomy. His reports on twenty cases of gangrene in the extremities are best summarized in his own words: "It has become fashionable to say that peri-arterial neurectomy should have no place in surgery. This attitude has been adopted largely because of our inability to produce any scientific justification for the operation, but there is no doubt of its practical value in the treatment of indolent ulcers, and in al-

of the brain although local areas of cerebral vasoconstriction may occur. The sensitive carotid sinus has been surgically denervated in seven cases with a complete cure of spontaneous attacks to date in every case.

#### IV EFFECTS OF SYMPATHECTOMY ON HYPERTENSION

A widespread interest in surgical attempts to lower states of excessive hypertension began in this country in 1934. Although the mechanism underlying essential hypertension is unknown, a neurogenic factor is probable because these subjects characteristically show excessive vasoconstrictor responses to cold and emotion. Hypertensives in the earlier stages of the disease who show this lability of blood pressure, who are under fifty years of age, and free from marked retinal and kidney damage, constitute the most favorable group for operation. Three types of procedure have been attempted at the Mayo Clinic and the results discussed by Brown, Craig, and Adson<sup>28</sup> and by Adson<sup>29</sup>.

1 Although favorable reports have been published on subtotal resection of the adrenal glands, a review of their experience on thirty-two cases indicates that nerve section is a more effective and less dangerous procedure. Adson reports a case, where an adrenal cortical tumor was suspected and from which he removed the right adrenal and about three-fifths of the left. The patient developed mild adrenal insufficiency, but without any effect on the blood pressure.

2 Subphrenic resection of the splanchnic nerves was performed in seven cases, but without a significant reduction of blood pressure. Adson has recently enlarged the scope of this operation by resecting the twelfth rib. The improved exposure is enabling him to remove a large part of the celiac plexus and the upper two lumbar ganglia, as well as the splanchnic trunks. He is most optimistic concerning the possibilities of this new method.

3 Ventral rhizotomy, from the sixth thoracic to the second lumbar segments, results in a sympathetic denervation of all the arteries below the diaphragm (75 per cent of the total vascular bed), the kidneys and adrenal glands, as well as in a reduction of intra-abdominal tension by relaxation of the abdominal wall. A series of twenty-two of these operations are reported by Adson. Excellent clinical effects, with sustained lower levels of blood pressure, resulted in nine. Only fair results were obtained in six cases, whereas three patients failed to obtain relief and two died following the operation. In two patients operation had been performed too recently to draw any conclusions. The fact that Adson is shifting his attack to a more extensive neurectomy beneath

the diaphragm coincides with the more conservative opinion that spinal root section is probably too radical and mutilating a procedure. Nevertheless, Heuer<sup>30</sup> has continued to advocate rhizotomy with considerable enthusiasm and a good number of really striking results. Out of a series of nine severe hypertensives two have maintained a pressure of 124/92 and 122/80 for over three months, and in three others the blood pressures have remained below 145/100. One patient was not improved and another died at the end of the operation. The other two were followed for only a month.

Peet,<sup>31</sup> who has had by far the largest experience with the surgical treatment of hypertension, has advocated a transthoracic but extrapleural resection of the splanchnic nerves above the diaphragm. He performs this operation bilaterally and usually at a single stage, resecting a short length of the tenth rib and retracting the pleura laterally off the sides of the lower thoracic vertebrae. This enables him to remove the lower portion of the ganglionated chain and a 10 cm length of the major, minor, and least splanchnic nerves. This operation is less likely to miss important connections or to be followed by nerve regeneration than the approach beneath the diaphragm, but Adson's modification of the latter procedure has the advantage of interrupting vasoconstrictor impulses to the legs as well as to the abdominal viscera. Peet has operated on over sixty severe hypertensives (systolic pressure over 200 mm) and has limited his selection only to patients below fifty and free from a significant degree of renal damage. There have been three operative deaths. Forty patients have been checked from two to eighteen months postoperatively. Six (15 per cent) are symptom-free and maintain a normal pressure suggesting permanent cure. Fifteen (37 per cent) show an appreciable drop in pressure with symptomatic improvement. Of the nineteen (48 per cent) showing no fall, many have improved symptomatically, especially in regard to headache.

The discrepancy in operative results and the different methods being employed make it obvious that no dogmatic views can be hazarded as yet concerning the ultimate value of these procedures. The invariably unfavorable prognosis of the severe forms of hypertension does, however, justify a certain degree of careful surgical experimentation. It seems as though this particular problem cannot be settled in the laboratory. Considering that the clinical evidence reviewed above is as encouraging as it is, further reports of prolonged postoperative observations will be watched with the keenest interest.

derma the operation was a complete failure in eight out of eleven cases. In the feet there was only one late failure after twenty lumbar ganglionectomies. This occurred in a severe case complicated by ulceration. These statistics bring out very clearly the difference described above in the relative effectiveness of cervicothoracic and lumbar ganglionectomy.

In circulatory disorders following infantile paralysis resulting in coldness, cyanosis, and ulceration of the legs, lumbar ganglionectomy gave a worth-while increase in circulation in twenty-three out of twenty-six cases. One case was reported in which lumbar ganglionectomy was without effect on the trophic ulcerations of spina bifida.

In thromboangitis obliterans the beneficial effects of sympathectomy seem to depend upon the possibility of dilation of the peripheral vessels as yet unaffected by the disease. This gives the all-important collateral circulation a chance to develop. It is questionable whether the pathologic process is retarded by the operation, and there is no doubt that serious complications of the disease can appear very shortly after operation. In two of the reported cases amputation had to be undertaken because of popliteal thrombosis which took place within a week of the patient's discharge from the hospital. In twenty-nine cases of intermittent claudication a notable increase in walking ability took place in nineteen. Rest pain was relieved in twelve out of fifteen cases. In twenty-two cases complicated by gangrene of the toes, fourteen were arrested, but eight required a major amputation. Two out of three cases of the disease in the arm were benefited by cervicothoracic ganglionectomy.

Bird<sup>21</sup> has called attention to the value of sympathectomy or sympathetic block when an important artery must be divided or has been suddenly occluded. He performed a lumbar ganglionectomy four weeks prior to an obliterative aneurysmorrhaphy on the popliteal artery and records a most satisfactory state of the circulation after the operation.\*

Sympathectomy as a cure for the extreme and disabling forms of hyperhidrosis in the extremities is becoming a recognized procedure. The most interesting report on this condition is that published by Adson, Craig, and Brown,<sup>22</sup> who describe five successful cases. They comment on the fact that this excessive form of sweating occurs in the asthenic type of individual. Besides showing various forms of vasomotor instability, these patients are prone to

have functional disorders of the gastrointestinal tract, fatigued states, and vasomotor rhinitis. The conception that this condition originates in higher centers is strengthened by the report of a boy who during his waking hours would develop drenching sweats and a fall of body temperature to as low as 91°. Sleep and amylal anesthesia controlled the central irritability with a disappearance of hyperhidrosis and a return of normal temperature. The probable etiologic factor was encephalitis.

A new and somewhat questionable application of cervical sympathectomy has been reported for the treatment of retinitis pigmentosa. In this type of progressive blindness there is a striking pigmentary degeneration and narrowing of the retinal vessels. Although it is well known that cervical sympathectomy produces a definite and lasting dilation of the vessels in the normal retina, this is unlikely to occur in a condition where they are compressed by gliosis of the retina. Walsh and Sloan<sup>23</sup> have reported three cases with failure in two and "a possible slight benefit" in the third. They state specifically that ophthalmoscopic examination failed to show increased size of the retinal arteries. After operation on six cases, de Takats and Gifford<sup>24</sup> found that in no case was there an improvement in the acuity of vision or in the visual fields. In two out of four cases MacDonald and McKenzie<sup>25</sup> report only slight improvement, but conclude with the hope that advancing loss of vision may be held in check by the operation. Kerr,<sup>26</sup> who has published the most successful series, reports improvement in only three out of eight cases.

The experimental work of Heymans and his colleagues on the regulation of cardiovascular tone by the carotid sinus, which was reported in last year's review,<sup>1</sup> has led to the description of a most interesting clinical syndrome by Ferris, Capps, and Weiss.<sup>27</sup> This study is based on observations on thirty-two patients who suffered from spontaneous attacks of dizziness, weakness, and unconsciousness, with or without convulsions, and in whom mechanical stimulation of the neck over the carotid bifurcation promptly induced manifestations of identical nature. The evidence indicates that these attacks depend on hyperactivity of the carotid sinus reflex. Depending on the efferent pathway involved, three types of syncope and convulsions have been described: (a) the type depending on inhibition of heart rate, (b) the type depending on a fall in arterial pressure, (c) the "cerebral type" in which changes in neither heart rate nor blood pressure plays a rôle. Type (a) is purely a vagal reflex and can be abolished by atropin. The cerebral type, however, is uninfluenced by drugs. It is interesting that, as in epileptic fits, the convulsions are not accompanied by a generalized anoxemia.

\*At the Massachusetts General Hospital we have had a similar satisfactory experience with paravertebral lumbar novocain and alcohol injection in a case of embolism of the iliac artery. We have been intending to use the same procedure when it becomes necessary to ligate the carotid or subclavian artery. The value of alcohol by mouth as a vasodilator should be kept in mind for use in acute arterial occlusions when the patient is far from a hospital.

at the Mayo Clinic. The operation is not followed by any deleterious effect in the female and normal parturition has followed on numerous occasions. Behney<sup>39</sup> has performed presacral neurectomy on twenty-two patients with incurable carcinoma of the cervix uteri. All of these women had received intensive radiation therapy, but continued to suffer excruciating pain in the lower abdomen, sacral region, and even in the thighs. When pain could not be palliated and x-rays of the pelvic girdle revealed no bone invasion, the superior hypogastric plexus was resected from the inferior mesenteric artery down to the uterosacral ligaments. While Behney states that this operation will not affect pain due either to ureteral obstruction or to bone metastases, it relieved 72 per cent of his selected cases. The immediate operative mortality was 14 per cent, but seven of the cases lived less than four weeks after the operation. Bladder pain, unfortunately, is not equally susceptible to relief by presacral neurectomy, because many afferent fibres enter the sacral nerves.

#### VI. EFFECTS OF SYMPATHECTOMY ON VISCERAL MOTOR INNERVATION

In continuation of an interesting series of experiments which were published in 1934, Knight<sup>40</sup> has given further evidence of the relationship of sympathetic tone to achalasia of the cardiac sphincter. By stimulation experiments in cats he has shown that the interdiaphragmatic and intra-abdominal portions of the esophagus function as a true intrinsic sphincter which is relaxed by the vagus and contracts on sympathetic stimulation. The sphincter receives its sympathetic supply from the celiac plexus in fibres which follow the course of the left gastric artery and its esophageal branch to the lower end of the esophagus. Excision of the extrinsic nerves supplying the esophagus showed that vagal section produced achalasia of the cardia. If, however, both thoracic sympathetic chains were excised at the same time, no obstruction resulted at the cardia. After achalasia had been produced by vagotomy, subsequent celiac sympathectomy resulted in complete relief. Knight divides esophageal obstruction in man into (1) cases of vagus failure—achalasia, (2) cases of spasmodic contraction—cardiospasm, (3) hypertrophic stenosis of the cardia. The first two result from autonomic imbalance in the control of the cardia and can be improved by sympathectomy. Knight and Adamson<sup>41</sup> report six cases in which achalasia was relieved by excision of the left gastric artery with its surrounding fat and nervous tissue.

After investigation of the nervous control of defecation, Denny-Brown and Graeme Robertson<sup>42</sup> have emphasized the importance of in-

trinsic reflexes which are active after injuries to the lumbar and sacral portions of the spinal cord. Under these circumstances distention causes contraction of the rectum with reciprocal relaxation of the anus. When the sacral cord segments are intact, spinal reflexes bring a greater fusion of rectal contractions with a consequent more massive and complete defecation. As in the case of their previous work on the bladder, these investigators state that the sympathetic nerves (hypogastric) to the rectum and anus are no part of the nervous mechanism essential to evacuation. The mechanism of defecation, provided delivery of fecal material from the colon is adequate, depends primarily upon the reaction of the rectum to distention. Woolard<sup>43</sup> has reached a very similar conclusion as he holds that the concept of sympathetic inhibition of bowel tone and tightening of the internal sphincter, with opposite effects on the part of the sacral nerves, is an oversimplification of the problem.

Trumble<sup>44</sup> in experiments on dogs and monkeys arrived at somewhat different conclusions, as he often observed inhibitory effects upon the colon on stimulating the lumbar sympathetic nerves. He calls attention to the fact that peristalsis is always inhibited in the course of laparotomy, unless these nerves are blocked by spinal anesthesia. On stimulation of the pelvic parasympathetic nerves he observed quite constantly that the colon and rectum were shortened and drawn down toward the pelvis. Furthermore, after degenerative section of the pelvic nerves, dogs do not store feces, but pass numerous small masses throughout the day and night. Storage and mass evacuation are abolished, and the inherent peristaltic mechanism of the alimentary canal, previously kept under control by the pelvic nerves, comes to the fore and material is passed as it becomes available. This type of defecation is seen clinically in the frequent small stools which are passed involuntarily after injuries to the spinal cord and in patients with colostomies. Trumble's observations of inhibition of peristalsis in the colon on sympathetic stimulation and its increased activity in the course of laparotomy when these nerves are blocked, may explain the favorable results of sympathectomy in megacolon, as this procedure partly releases the intrinsic neuromuscular mechanism (described by Denny-Brown and Graeme Robertson) from abnormal interference of higher reflexes. The excellent results of this operation are best brought out in Ross's<sup>45</sup> collected statistics. Of twenty-nine cases of Hirschsprung's disease in children, twenty-one are reported as completely successful, seven as improved, and only one as being a failure. Many of these were followed for over two years. Ross reports distinctly inferior results in the acquired form of intestinal stasis

## V SYMPATHECTOMY FOR VISCERAL PAIN

In discussing the effect of sympathectomy on pain it is always important to emphasize that, strictly speaking, the sympathetic is purely a motor system to control and correlate visceral activity. However, somatic sensory fibres, identical with those which run in purely sensory nerves to the skin, are found in all the important nerves to the viscera. One seeming exception is that no afferent fibres run in the upper portion of the cervical sympathetic trunk. It is, therefore, hard to explain why cervical sympathectomy should be of value in the relief of migrainous headaches. Several years ago Dandy reported two successful results from this procedure, and Craig<sup>32</sup> has reported two further instances. In each case, where all other measures had failed, cervicothoracic ganglionectomy has resulted in complete relief lasting from four to fifteen months. The benefit, however, was not immediate, but resulted in a rapid diminution of the severity of headaches. It is therefore evident that the effect was not due to an interruption of sensory pathways, but to some influence on the motor mechanism of the attacks.

In their experiments on cardiac pain, in which they injected twenty per cent lactic acid into the coronary arteries after decerebration, Moore and Singleton<sup>33</sup> found that pain reactions were constantly present as long as the thoracic sympathetic chains remained intact. In contrast to this, resection of the upper thoracic ganglia on one side (stellate to seventh thoracic) uniformly prevented any signs of discomfort following the injection of the corresponding coronary artery. These clear-cut experiments indicate that pain fibres ending in the region of either coronary artery reach the spinal cord by way of the ipsilateral rami of the upper thoracic sympathetic ganglia. The authors also showed that removal of the cervical sympathetic trunks and vagotomy were without effect. They therefore concluded that, if this scheme of innervation in cats applies to man, resection or injection of the upper thoracic portion of the ipsilateral sympathetic chain should be the operation of choice for coronary pain.

Mandl,<sup>34</sup> who originally advocated paravertebral injections for cardiac pain, has published statistics of the results of his alcoholic injections for angina pectoris and other forms of visceral pain. In a series of fifty cases there have been no serious complications. He has obtained favorable and lasting relief of angina pectoris in 50 per cent of his cases.

In an impartial evaluation of the two outstanding methods for the surgical treatment of angina pectoris, Marvin<sup>35</sup> has compared the results of paravertebral alcohol injection with those of total thyroidectomy. He states that

"the percentage of relief following alcohol injections is higher than that following thyroidectomy. Further advantages of this procedure are the absence of operative mortality, the absence of any permanent ill effects, the short period of hospitalization (usually three or four days as compared with several weeks for thyroidectomy), and the possibility that other methods may be tried in case of failure without the patient's condition having been altered for the worse. The disadvantages are chiefly three: the technical difficulty of injecting the alcohol accurately, the neuritis that follows it, and the fact that relief is strictly limited to the side on which injection is performed." Speaking of total thyroidectomy, Marvin points out that "The disadvantages are numerous, they include operative and postoperative death, recurrent laryngeal nerve paralysis, parathyroid insufficiency, and myxoedema."

The most recently published statistics on the results of paravertebral alcohol injection for angina pectoris from the Massachusetts General Hospital<sup>36</sup> are as follows: Thirty-six patients with intractable angina pectoris have been injected. Of these, 67.7 per cent have been relieved (on the side injected), an additional 17.6 per cent have been reduced from the severest form of the disease to mild infrequent attacks which are easily controlled by nitrites. Only 14.7 per cent have failed to secure relief, all of these failing in the first half of the series. There has been no failure after a satisfactory alcohol block and only one early death which could possibly be attributed to the injection (probably a coincident painless coronary occlusion). Recent improvements in the technique of injection<sup>37</sup> have greatly reduced the ensuing intercostal neuritis, which has constituted the single drawback to this valuable procedure.

Another type of sympathetic intervention for visceral pain which has been extensively discussed in the past year is presacral neurectomy. Pemberton<sup>38</sup> has reported fifteen operations for essential dysmenorrhea in which a cervical dilatation and an Olshausen suspension were performed in addition to the presacral neurectomy. This makes it difficult to judge the specific value of the neurectomy per se, but twelve were relieved, one was considerably benefited, and two obtained no improvement. The author states that dilatation and suspension relieve about 65 per cent, so that the addition of the neurectomy is a distinct benefit. He also advocates this form of neurectomy as an adjunct in the treatment of dysmenorrhea associated with pathologic conditions such as chronic pelvic inflammation, painful fibroids, and prolapse. In advanced cancer of the cervix Pemberton failed to secure improvement in four cases. Counsellor<sup>39</sup> reports that presacral neurectomy has given satisfactory results in 90 per cent of the cases.

CASE RECORDS  
of the  
MASSACHUSETTS GENERAL  
HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED  
IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

FOUNDED BY RICHARD C CABOT, M.D.

TRACY B MALLORY, M.D., *Editor*

CASE 22361

PRESENTATION OF CASE

*First Admission* A fifty-three year old American motorcyclist entered complaining of left flank pain.

Eight weeks before admission he experienced a rather sharp pain in the left groin which worked its way up into the left flank. At the same time he had chills and fever frequently throughout his illness. For the first six weeks the pain was a persistent dull ache, but occasionally was very sharp. It was not radiating but was aggravated by moving, coughing and deep inspiration. During the past two weeks there was a visible, acutely tender swelling in the left flank. He had lost twenty-six pounds in weight during this illness.

His mother died of carcinoma of the cervix. His first wife died of tuberculosis thirty years before admission. His second marriage occurred fourteen years later. He had one child living and well.

His past history is noncontributory, except that two months before his present illness a boil over the lumbar spine was incised by a physician. This healed well.

Physical examination showed a well-developed and poorly nourished man who moved about with his spine erect. The neck was not stiff. Examination of the right chest was negative. The lower half of the left chest posteriorly was dull. This dullness merged with that of a tumor in the left flank. The latter was described as an inverted, bowl-like, fluctuant tender mass approximately 5 centimeters in diameter. When the patient coughed the impulse was transmitted into the mass. Above this area, at about the angle of the scapula, were a few coarse râles. The heart was not enlarged. No murmurs were heard. The blood pressure was 110/60.

The temperature was 99.3°, the pulse 92. The respirations were 32.

Examination of the urine was negative. The blood showed a red cell count of 3,070,000 with a hemoglobin of 60 per cent. The white cell count was 13,200.

X-ray examination of the spine showed slight arthritic changes but was otherwise negative. Examination of the urinary tract showed that

the kidney outlines were normal in shape and position on both sides. The right was considerably larger than the left.

In the Emergency Ward odorless, thick, greenish gray, purulent material was aspirated from the left flank mass. A smear showed gram-positive diplococci. The following day an oblique incision, about 8 centimeters in length, was made over the mass just below the last rib. A very large abscess cavity was immediately entered which contained thick pus and a good deal of free gas. The cavity extended upward under the twelfth rib and led to an abscess in the left paravertebral region, extending up almost to the scapula. A large sized chest tube was sewed into the cavity and brought out through the wound at the lower end.

A chest film taken on the sixth postoperative day showed dullness in the lower part of the left chest. The shadow was rather faint, roughly triangular in shape with its apex toward the hilus and the base on the axillary border. The costophrenic sinus on this side was obliterated. The outline of the diaphragm was distinctly seen but was higher on the left than on the right.

He did fairly well and was discharged three weeks after operation. At that time the cavity had a capacity of 10 cubic centimeters and there was probably a bronchial fistula.

*Second Admission* two years later

His wound had healed well and he had no complaints until about nine months before entry when he began to spit up small amounts of blood every day. Associated with this was the gradual onset of pain, wheezing, hoarseness and exaggeration of his shortness of breath which he had noticed upon exertion during the past two years. The pain was dull but at times was sharp and knife like, occasionally radiating down along the costal margin and often to the back. It was aggravated by lying flat but not by coughing. For the past six months he had frequent attacks of nocturnal dyspnea. His physician sent a specimen of his sputum to a laboratory and it was reported as negative for tuberculosis.

Physical examination showed a rather obese middle-aged man in no acute distress, occasionally coughing up bloody sputum. His voice was hoarse. The right chest was negative. The left upper lobe anteriorly showed dullness, absent tactile fremitus and voice sounds and diminished breath sounds. Expiration was prolonged. Inspiration was wheezing and "crowing." Posteriorly the upper half of the left lung field was dull and had diminished breath sounds, voice sounds and tactile fremitus with occasional râles. The base was also dull and no sounds could be heard. The heart was not remarkable except for a soft apical systolic murmur. The blood pressure was 140/80. The



in adults. In a series of fifteen cases, only four were successful, four were improved, and seven failed to obtain any benefit.

Ross<sup>14</sup> reports several good results of sympathectomy in cases of bladder dysfunction associated with megacolon, but attempts to relieve bladder paralysis by presacral neurectomy (section of the sympathetic "bladder filling" nerves) have been so discouraging that reports of this procedure have disappeared from the literature. Under the most favorable circumstances satisfactory emptying of the bladder can be mediated by the intrinsic reflex mechanism. This, however, is less effective than in the passage of feces. When it is ineffective with a large amount of residual urine and chronic infection, presacral neurectomy offers little hope of reestablishing normal micturition. In experiments on dogs and cats Creevy<sup>45</sup> and McCaughan and Hershey<sup>46</sup> have shown that section of the hypogastric nerves produces only a slight transitory increase in the frequency of micturition. When the bladder is severely damaged by cutting the pelvic nerves, additional section of the hypogastric fibres produces no change. In recent and unpublished cystometric observations on human beings after presacral neurectomy, Munro has noticed no alteration in the behavior of the bladder.

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ected below the level of the diaphragm, but if the cavity was found to extend as high as the scapula one could assume that the pleural cavity must have been entered. However, if such were the case x-rays six days later would be expected to show a partial pneumothorax with partial collapse of the lung on the affected side. So it might be possible that the pus was entirely outside the pleural cavity. On the other hand x-ray showed that the costophrenic angle was dull, a decided factor in favor of pleural cavity involvement.

The presence of gas is hard to explain. Foul smelling pus, with gas, due to an anaerobic streptococcus is sometimes found in empyema following certain atypical cases of pneumonia not due to the pneumococcus. Colon bacilli a common cause of gas were not reported. Possibly a culture would have shown them. Air from the lungs through a fistula seems unlikely.

A PHYSICIAN: Could it not have been a bronchial fistula?

DR ADAMS: Then there should have been more signs in the chest cavity, and the man would have been coughing up more pus than the history indicates.

I do not know what evidence there might have been of probable bronchial fistula. Its presence could have been determined definitely by injecting a small amount of Dakin's solution or some similar preparation into the cavity. If a fistula existed, a sufficient amount of the liquid would have found its way through the fistula to enable the patient to smell or taste it. Demonstration of its existence in this case would help to determine whether the abscess found at operation did or did not extend into the pleural cavity.

A PHYSICIAN: It would have been easy enough with lipiodol.

DR ADAMS: Yes, it probably would have, but the test just mentioned does not require another x-ray.

It is impossible to decide on the basis of the evidence at hand how the abscess originated, or whether it existed above or below the diaphragm, or both. My conjecture is that it started below the diaphragm and extended upward into the pleural cavity, but it could just as well have started in the chest from an embolic focus and worked downward.

On his second admission this patient had a new series of complaints. Barring local lesions in the nose or throat, the most common causes of hemoptysis are tuberculosis, bronchiectasis or lung abscess, and congestive heart failure, of the heart lesions mitral stenosis is the most frequent. Aneurysm and mediastinal, lung or bronchial tumor should also be considered, but these are not seen so often. The history is not

inconsistent with any of the aforementioned, but points toward none of them in particular. Wheezing hoarseness and pain are not common with mitral disease, they suggest, rather, bronchopulmonary or mediastinal disease.

Physical examination points definitely toward disease involving the left upper lobe. Three possibilities are to be considered: (1) tuberculosis, (2) some process related to the previous infection and (3) tumor.

It is hard to believe that he could have tuberculosis sufficient to give the symptoms and signs described without more evidence of systemic reaction. Tuberculosis does not usually cause bronchial obstruction. He is well nourished, apparently he has not been losing weight, and there is no history of weakness, fever, or the other common symptoms of advanced tuberculosis. Furthermore there was at the previous admission no evidence of tuberculosis.

Assuming as we do, that he had trouble with the lung previously, it is natural to consider seriously the extension or recrudescence of this trouble as the cause of this present difficulty. This dullness absent tactile fremitus, and the character of the breath sounds can be satisfactorily explained on the basis of an old chronic infectious process in the lung, probably with bronchiectatic abscess and marked thickening of the pleura. Obviously, air is not going into the upper lobe in normal fashion. The lower lobe findings are probably due to thickened pleura, the result of the former damage in this area. Bleeding, as indicated earlier, is common with bronchiectasis or abscess. Hoarseness, however, is difficult to explain on this basis.

Tumor could give a similar picture with infiltration of the lung and, probably, block to the passage of air in a large bronchus. Hoarseness would then be accounted for by pressure on the recurrent laryngeal nerve. Clubbing of the fingers is seen with any of the usual chronic lung conditions, most commonly with abscess or bronchiectasis.

The presumable enlargement of the liver is difficult to explain unless on the basis of metastatic malignant disease.

The laboratory findings are not helpful. With malignant disease of nine months' duration or with chronic infection, one would hardly expect the red count to be as high as 5,000,000.

The x-ray report seems to localize the condition to the left lung, chiefly the upper lobe, but does not clarify the problem. There is, obviously, contraction due to pleuritis, with pulling of the mediastinum toward the left. There is evidence of bronchiectasis or abscess in the left upper lobe and an area of density around it due, likely to pulmonary infiltration. Scar tissue contraction could reduce bronchial caliber and give rise to the atelectasis.

On the other hand, cancer of the lung, which

liver edge was felt three fingerbreadths below the costal margin. There was early clubbing of the fingers.

The temperature was 99.8°, the pulse 100. The respirations were 24.

Examination of the urine was negative. The blood showed a red cell count of 5,060,000, with a hemoglobin of 75 per cent. The white cell count was 15,000, 74 per cent polymorphonuclears. The sputum was mucopurulent and bloody. A smear showed numerous gram positive cocci and bacilli. The stools were negative. A Hinton test was negative.

A film taken six weeks before admission in the Out-Patient Department showed homogeneous dulness in the region of the left upper lobe, in the center of which were ring-like shadows of decreased density, very suggestive of a cavity but without any definite fluid level. There was also an increase in the dulness previously described at his first admission. The heart and mediastinum were pulled somewhat to the left. There was a definite elevation of the left bronchus and a bulge in the region of the pulmonary conus. The entire left chest was smaller than the right. An oblique view showed thickened pleura. The findings were those of an incomplete atelectasis of the left upper and lower lobes with a probable area of destruction within the upper lobe. A gastrointestinal series showed no evidence of intrinsic disease of the esophagus, stomach or duodenum.

Bronchoscopic examination showed complete obstruction at the left lower lobe bronchus and partial obstruction to the left upper lobe. No tumor mass, outcropping or hemorrhagic area could be seen. The obstruction seemed to be entirely peribronchial thickening.

Three weeks after admission an exploratory thoracotomy was performed. He did poorly postoperatively and died three days later.

#### DIFFERENTIAL DIAGNOSIS

DR F. DENNETTE ADAMS. Infection is certainly indicated by the history on the first admission. In many cases it is important to distinguish between the true chill and the chilly sensations which accompany the onset and occur during the course of certain specific infections, but the distinction is not made in this case.

The cough and yellow sputum suggest disease of the lungs or pleural cavity, pain aggravated by cough, moving or deep breathing, is also often characteristic of pleural involvement. However, one rarely finds the pain of pleurisy actually in the flank, it is usually higher and farther forward. Other types of pain—that referred from disease of the spine, or spasm of the back muscles, for example—are usually aggravated by very much the same movements.

The appearance of swelling in the left flank

probably indicates a collection of pus. Whence has it originated? There are several possibilities. This patient could conceivably have had pneumonia followed by empyema, and the picture on admission could have been that of empyema necessitatis—a spontaneous breaking through of the pus toward the surface. We have nothing in the history, however, to point toward previous pneumonia. Furthermore, empyema necessitatis usually appears anteriorly. Tuberculosis is suggested by the fact that the patient's first wife died of it; intimate exposure is established. Sources of pus in this disease could be a cold abscess of a rib, but this is usually a much less acute process, or it could be pyopneumothorax, which is, however, only a remote possibility. Pneumothorax usually begins suddenly, with acute dyspnea, pain in the chest, probably collapse, and pus, once formed, would be apt to drain through the hole in the lung rather than burrow a new passageway to the surface.

A much more likely answer to our question than any of these is that deduced from the relation that the collection of pus may bear to the abscess of the back which had been opened two months previously. That incision may have provided inadequate drainage and if such were the case it is conceivable that the infection worked inward, spread upward under the diaphragm, and entered the pleural cavity by extension through the diaphragm.

Even more likely is the possibility that an embolic focus started in the lung or pleura and produced pus in the left pleural cavity which extended downward through the diaphragm.

Acute severe infection with, doubtless, dehydration is a plausible explanation of the marked loss of weight.

The description "moving with the spine erect" probably means moving with the spine held in a rigid posture. This is a protective mechanism traceable to irritation of the back muscles, probably the erector spinae group.

The lung findings are not completely reported. Perhaps there was so much edema of the soft tissues that breath sounds in the affected region could not be heard. The presence of impulse on cough does not necessarily point to direct connection of the abscess with the pleural cavity. Downward motion of the diaphragm might produce it, even if all the pus were below this structure.

The first series of x-rays was noncontributory, except for excluding a large infected kidney. Considering the history and physical examination, such a possibility would not seriously have been entertained. X-ray would not necessarily exclude perinephric abscess, which would be more likely than actual disease of the kidney.

The report of the operation does not make it clear whether the pleural cavity was actually entered. Surgical entrance must have been of

DR ADAMS Is it not unusual for an empyema necessitatis to burrow in that particular direction?

DR MALLORY It is a thing one reads about but does not see very often. I am not absolutely certain about it in this case and admit I am guessing. We found a little scar tissue in the situation which would fit such a hypothesis, but that is not proof.

A PHYSICIAN Did the second illness have anything to do with the first one?

DR MALLORY I doubt if it had the slightest. It is an interesting case from the point of view of determining how long it takes a lung cancer to grow. We have had lung cancers where the story of hemoptysis went back as much as seven years before the onset of any other symptoms at all. Then we occasionally see a case like this where because of some other illness we have had a chest plate within the preceding two years and the early chest plate fails to show lesions. This first plate was taken two years before the final entry and no one has been able to find a trace of tumor though it seems to be a very good plate. We had another case a few days ago where a chest plate was taken four years before and again one year before the symptoms of the final illness. Both of these were negative except for old tuberculous scars but within the last year he developed a sizable tumor mass bigger than a golf ball.

### CASE 22362

#### PRESENTATION OF CASE

*First Admission* A fifty-six year old American housewife was admitted complaining of pain and bleeding with defecation.

For about three years the patient had progressive rectal pain with bowel movements, and defecation was often followed by the passage of some bright red blood. For about four months these symptoms were considerably increased in severity. The pain often occurred before, during, and after bowel movements and was sharp and pulsating in character. Occasionally it lasted for an entire day with frequent sharp shooting pains superimposed upon it. In the past she had noted occasional tarry stools but this had not occurred for several months preceding her entry. Currently there was frequent rectal tenesmus often followed only by the passage of a small amount of bright red blood. For about four months she had palpitation, slight dyspnea with exertion, ankle swelling, and puffiness of the eyes in the morning when arising. There was increasing diurnal frequency of micturition and a nocturia of four to five times. On several occasions she noted that urine left standing in the chamber overnight was rather red in appearance. She received medical

treatment for hemorrhoids for several months. Her weight decreased from 152 to 114 pounds during the preceding two years and there was concomitant weakness and ready fatigue.

The patient had typhoid fever at the age of eleven years. An appendectomy was performed fourteen years before admission and a Polya gastric resection for duodenal ulcer two years later.

Physical examination showed an emaciated, sick looking middle-aged woman with haggard facies and rather pasty pallor. The mucous membranes were pallid but the tongue was normal in appearance. The lungs were clear and the heart normal. The blood pressure was 105/60. The abdomen was flaccid and the liver extended down to the iliac crest. Its surface was smooth. Inspection of the anus showed two large thrombosed hemorrhoids. Rectal examination was negative.

The temperature, pulse and respirations were normal.

Examination of the urine showed a trace of albumin but was otherwise negative. The blood showed a red cell count of 3,600,000, with a hemoglobin of 60 per cent. The white cell count was 9,000, 62 per cent polymorphonuclears, 21 lymphocytes, 1 abnormal lymphocyte, 2 monocytes, and 4 eosinophils. A stool examination was normal and a guaiac test negative. The nonprotein nitrogen of the blood was 26 milligrams.

A flat x-ray film of the abdomen showed normal kidney outlines. There was a soft tissue shadow on the right side which extended down to the crest of the ilium. This had the characteristics of the liver. A barium enema showed no evidence of intrinsic disease of the colon although the transverse colon and hepatic flexure were displaced downward by the enlarged liver.

The patient showed a low-grade fever up to 100.5° during her hospital stay. On the eighth hospital day an anal fissure and hemorrhoids were excised and the patient was discharged on the twelfth postoperative day.

*Final Admission*, forty-nine days later.

For two weeks following her discharge the patient was much relieved of her previous symptoms although weakness and swelling of the legs prevented her from walking. Six weeks before reentry she developed severe diarrhea accompanied by cramps across the lower abdomen. The stools were frequent, watery, slimy, and questionably bloody. Two days before coming to the hospital the patient experienced a sharp lancinating pain in her left shoulder and noted that her left hand was swollen. Up to the time of entry swelling of the left hand and forearm increased rapidly and pain in the entire extremity became constant and excruciating in character.

has broken down, could give a similar picture and would be more apt to cause bronchial obstruction

Bronchoscopic examination provided no added information, except for showing bronchial block and excluding tumor in the lumen of the bronchus

I do not believe there could be complete obstruction, otherwise the purulent sputum arising in the abscessed region would not be coming through

The diagnosis in this case is very difficult. The patient appears to have had empyema and abscess in the retroperitoneal region two years ago. Now he returns to the hospital with a destructive lesion in the left upper lobe. My inclination is to adhere to the principle of not making two diagnoses where one may suffice. I believe that the recent process is related to the older, that he has developed a slowly progressing, nontuberculous infectious process in the left upper lobe, with destruction of the lung tissue, with contraction due to scar formation, and with abscess or bronchiectasis. However, it is impossible to exclude cancer with secondary abscess, and I would not be surprised if Dr Mallory reports this as the postmortem diagnosis

DR TRACY B MALLORY With upward extension of infection, would you not expect to find the most advanced lesion in the lower rather than in the upper lobe?

DR ADAMS Yes, unless it has slowly spread to the upper lobe

#### CLINICAL DIAGNOSIS

Carcinoma of the bronchus, left

DR F DENNETTE ADAMS' DIAGNOSES

Chronic infectious process of the left lung with abscess formation

Chronic pleuritis

Cancer of the lung?

#### ANATOMIC DIAGNOSES

Epidermoid carcinoma of the lung with metastases to the bronchial and mesenteric lymph nodes, and with erosion of the pulmonary artery

Hemorrhage into the bronchial tree

Pulmonary abscess

Pleuritis, fibro-fibrous, left, marked

Arteriosclerosis Pulmonary artery, marked, aortic and coronary, slight

Operative wound Exploratory thoracotomy

#### PATHOLOGIC DISCUSSION

DR MALLORY What we found was a combination of cancer and abscess. There was a cancerous infiltration of the bronchus leading to the left upper lobe which almost completely

occluded the lumen. There was still a very narrow air passage left, however, down the center. The entire lung beyond that was a mass of necrotic cancer with numerous pus-filled cavities. That is a very common combination since the moment you begin to get bronchial obstruction the likelihood of infection beyond the point of the obstruction becomes very great. In a great many of these cases of cancer of the lung it is the infection beyond the cancer that causes all the symptoms rather than the cancer itself. I think that was probably more or less true here.

The lower lobe was somewhat atelectatic but otherwise negative. The right lung showed a moderate grade of compensatory emphysema. The entire pleural cavity on the left was obliterated by old fibrous tissue. I cannot make any accurate guess as to how long it had been obliterated. We found nothing in the abdominal cavity to explain his previous abscess and draining sinus and the scar so far as we could make out seemed to lead up to the pleural cavity. It seems reasonable to conclude he had empyema entirely unconnected with the present illness which nearly drained itself, the surgeon finally aiding with an incision through the skin. There were no metastases at all. A good many of these lung cancers metastasize very early and, as you probably know, they have some very characteristic sites for metastases. The brain is a particularly common one and the largest series of cases of cancer of the lung that has been reported in this country came from Cushing's clinic in the Brigham Hospital. In most of the cases of cerebral metastasis the first symptom was that of brain tumor. Another place that we have found metastases with remarkable regularity has been in the adrenals, metastases to both adrenals are very common with pulmonary cancers. I think it is perhaps fair to assume that the sepsis killed him too soon to give a chance for metastasis.

Of course one way of making an absolutely positive diagnosis in this sort of case is to obtain a specimen by bronchoscope which shows tumor. Until you do that you can never do more than guess, but where there is no obvious tumor mass projecting up the bronchus the bronchoscopist may not be able to get a specimen. Speaking from considerable practical experience, the piece of tissue that the bronchoscopist is able to get is frequently so extremely minute that the pathologist may not be able to make the diagnosis anyway. A negative bronchoscopy is of little significance as compared with a positive one because the bronchoscopist may not pick his material from the right spot, and may not have obtained enough to give the pathologist a fair chance to make a diagnosis. One should never take a single negative bronchoscopy too seriously.

## X-RAY INTERPRETATION

DR AUBREY O HAMPTON She had an intravenous prelogram at the first visit. It was negative. This is the first barium enema. We found nothing wrong. That was at the first admission. This is the second barium enema. Here is the liver. It is quite obvious there and fairly obvious here. If anything the liver seems to be enlarged. There is a film after evacuation. There is no evidence of gastrocolic fistula at all.

DR SOWLES This sudden attack of loose movements and watery diarrhea suggests that she might have perforated a jejunal ulcer through into the colon but that is not confirmed by the x-ray.

DR HAMPTON Barium was given by mouth. There is a small quantity in the stomach at this time which emptied out into the jejunum. There is no obstruction to the posterior gastroenterostomy stoma. This looks as if the stomach were amputated just distal to the stoma. There is no stomach to the right of the stoma and the stoma itself shows this irregularity apparently two ulcerations superimposed. The jejunum itself is below the ulceration. The patient was quite tender and nauseated and compression could not be used. I attempted the second examination after we were sure that she did not have a gastrocolic fistula and at that time I intended to fill the stomach with barium if possible. That was the day before she died and I was unable to do so.

## DIFFERENTIAL DIAGNOSIS

DR SOWLES The temperature of 102° could be due to an infectious process as indicated by the high white count and the high polymorphonuclear count or may possibly be due to metastatic disease in the liver. I feel that she had another and more important lesion than that which brought her to the hospital. The fever, the anal pain and the bright red blood were the prominent symptoms but I do not think they accounted for the loss of weight and the malnutrition. She had a curious circulatory disturbance, a thrombosis of the subclavian vein, possibly circulatory disturbance of the large bowel which may be thrombosis of veins there causing diarrhea and frequent watery stools. I think she has malignant disease of the stomach, possibly pancreas. I do not think it is a hangover from the duodenal ulcer. She has retroperitoneal extension of this disease to the mediastinum to the subclavicular region, possibly being a factor in her subclavian thrombosis, probably also extensive retroperitoneal extension downward which might possibly have interfered with the circulation of the large bowel causing acute intestinal symptoms, a large metastatic involvement of the liver.

DR. TRACY B MALLORY Are there any other suggestions?

A PHYSICIAN Was she proctoscoped?

DR SOWLES No, and that is an important point. She should have been proctoscoped. That is a definite slip up in diagnostic procedure. Although I do not think we would have found pathology we should not let her go without proctoscopic examination. She might have had a low polyp not demonstrated by x-ray.

## CLINICAL DIAGNOSIS

Carcinoma of the stomach metastatic.

DR HORACE K SOWLES DIAGNOSIS

Carcinoma of the stomach with metastases

## ANATOMIC DIAGNOSES

Carcinoma of the stomach with extension to the jejunum and the pancreas and with metastases to the mesenteric and retroperitoneal lymph nodes, the liver and the adrenals.

Operative scar. Posterior Polva resection of the stomach (for duodenal ulcer).

Peritonitis chronic fibrous, localized.

Bronchopneumonia right.

Thrombosis of the splenic vein.

Pulmonary emboli bilateral multiple.

Arteriosclerosis slight aortic and coronary.

Cholecystitis chronic.

## PATHOLOGIC DISCUSSION

DR MALLORY The autopsy on this patient showed a definite cancer of the stomach. It was situated immediately above and to some extent around the gastrojejunal anastomosis. In spite of the extent of the tumor and its immediate approximation to the anastomosis we found no obstruction. The tumor had extended directly from the posterior wall of the stomach back into the tissues overlying the pancreas and large tumor-filled glands were found lying around the pancreas. The pancreas itself however was involved to a very slight extent and obviously secondarily. There is no question but that the tumor was primary in the stomach. There were metastases in the liver and in the adrenals.

The surprising feature of the autopsy was a complete thrombosis of the splenic vein. At first we thought it was an actual ingrowth of cancer into the vein but microscopic examination showed that it was only freshly organized thrombus. I should assume as Dr Sowles did, that she had a similar thrombosis in the subclavian vein but we were limited to an abdominal incision and it was impossible to examine it. The immediate cause of death was not suggested from the history. There were multiple pulmonary emboli which very probably arose in the subclavian vein as we found nothing to account for them in the abdominal cavity.

Physical examination showed the left upper extremity to be swollen, shiny, and edematous. Pressure upon the extremity elicited considerable tenderness. Superficial veins over the arm and left side of the chest were dilated. The heart and lungs were negative. The blood pressure was 120/80. The liver extended three fingerbreadths beneath the costal margin and was nodular in consistency. There was slight tenderness in the left lower quadrant and both lower extremities were edematous. Pelvic and rectal examinations were negative.

The temperature was 100.4°, the pulse 100. The respirations were 25.

Two stool examinations showed positive reactions to the guaiac test. The blood showed a red cell count of 3,100,000, with a hemoglobin of 50 per cent. The white cell count was 17,000, 88 per cent polymorphonuclears. A Hinton test was negative. The blood chlorides were 102, the serum protein 4.2 grams and the nonprotein nitrogen 24 milligrams.

A gastrointestinal x-ray series showed a grossly abnormal posterior gastroenterostomy stoma. The distal third of the stomach did not fill with barium. Barium left the stomach rapidly and the motor meal reached the splenic flexure of the colon. There was no evidence of obstruction. The abnormality of the posterior gastroenterostomy stoma was characterized by gross thickening of the mucosa of the stomach and adjacent jejunum. There were two niche-like accumulations of barium, either of which could be ulcerations but neither of which were sufficiently characteristic to be identified as jejunal ulcers. There was an indefinite palpable mass in the region of the stoma. The liver was grossly enlarged and displaced the stomach and colon. There was evidence of fluid in the abdomen. The chest film showed a small quantity of fluid in both costophrenic angles. There was diffusely diminished radiance of both lung fields and the heart shadow was slightly enlarged. The left border was straight and sharp. Another barium enema showed no evidence of gastrocolic fistula or other disease of the colon.

The patient's temperature fluctuated irregularly up to 102° and the swelling and pain in the arm slowly subsided. The patient, however, gradually became weaker and died on the nineteenth hospital day, sixty-eight days after her initial entry.

#### NOTES ON THE HISTORY

DR. HORACE K. SOWLES. The type of pain and bleeding described at the start is characteristic of a very low placed intestinal lesion, either inflammatory, or possibly polyp, and is not characteristic of pathology higher up in the bowel.

"In the past she had noted occasional tarry stools."

It means blood from higher up in the intestinal tract.

"For about four months she had palpitation, slight dyspnea with exertion, ankle swelling and puffiness of the eyes in the morning when rising." I hesitate to make a comment on a medical problem but that would suggest cardiorenal disease. However, I think there are other things farther on that rule that out. I do not think we need to consider it as a cardiorenal question.

The Polya gastric resection was said to have been done for duodenal ulcer. Lesions of the duodenum are very rarely malignant. It seems rather unlikely that a malignant process would date back that far and that she would still be alive after a pylorotomy for a malignant process. It is possible but not likely. I think it was duodenal ulcer and not malignancy.

The physical examination would tend to rule out cardiorenal disease. The heart was normal, blood pressure low, and later on the nonprotein nitrogen was reported as normal.

They treated the local lesion of which she complained when she came in but that was not enough to account for the very marked loss of weight, the weakness and the fatigue. I think she must have had another lesion higher up in the intestinal tract which was the cause of the more severe systemic disturbances and of the occasional tarry stools. There was another intestinal tract lesion which may have been circulatory. It had a rather sudden onset, but we have no evidence of circulatory disturbance of the bowel. I have seen a case of lymphoma that went on for a year to two years with no general manifestations except bloody stools, with invasion of lymphoid tissues of the intestinal tract but did not invade the other lymphatic tissues or glands for a long period.

"Superficial veins over the arm and left side of the chest were dilated." That is definitely a circulatory disturbance, probably not arterial obstruction, not an embolus, or we would have had an absent pulse and gangrene of the arm. It must be obstruction high up, with whole arm involvement, so that it must be venous disturbance, pressure on the vein, perhaps peripheral thrombosis of the vein.

"The liver extended three fingerbreadths beneath the costal margin and was nodular in consistency." Previously it was reported as smooth, probably the first note was incorrect, although it may have been no fault of the observer. She may now have a thinner abdominal wall and it was easier to feel irregularities of the surface.

There is nothing remarkable in the laboratory findings except that the white count has risen and the percentage of polymorphonuclears is high, denoting an infectious process somewhere.

The blood serum goes with the loss of weight and malnutrition.

the doctors of this country. There seems to pervade the minds of our law-makers in some instances a purpose to protect the doctor more than the health of the people.

It is an established fact that the science of medicine has progressed more rapidly than its utilization by the average practitioner and that many people are unable to discriminate when obliged to select a medical attendant, and since there is only average ability in a part of the profession there must be a proportion of lower grade practitioners. This situation imposes a risk on uninformed persons who may suffer through the unwise selection of a physician. Since the possibility of this predicament is recognized movements by organized medicine have been under way for several years to certify to the qualifications of well-trained men in different departments of medical practice. The American College of Surgeons developed this plan for the certification of competent surgeons several years ago and this example has been followed by twelve other organized societies of national scope which are now prepared to certify to the proficiency of doctors in specified fields of practice.

The latest movement in this direction is that arranged by the American Board of Internal Medicine and full explanation of the composition and purpose of this organization will be found on page 470 of this issue.

This and other plans to assure to the public the best possible care in any designated field of practice should be encouraged. With the growth of specialties there will be an increase of apprehension on the part of the public that the general practitioner will be driven from his long-time honorable position.

This is unlikely but there will certainly develop changed conditions and relations of concern to the public and the profession. In the first place, certified specialists will be the resource of the general practitioner whenever he is confronted with uncertainties of diagnosis or treatment. On the other hand, there will have to be an adjustment of the relation of the specialist and the family attendant.

The situation at the present time is not always fair to the general man and the several groups of specialists must be willing to deal justly with those who seek their aid. Details of ethical practice must be observed between general practitioners and specialists in so far as this applies to recognized principles.

In these earlier years of plans for the certification of specialists, there will be some unavoidable difficulties, but these will disappear when better preparation for practice shall have become general. That is, there must be on the average a better type of general practitioner who is worthy of the respect of his specialist associate.

The future dignity of the profession in all of its branches will be assured when no one, other than well-educated doctors, is given the right to practice.

The prospective doctor must realize that the medical education of a given period should not be regarded as adequate for later years and that if he expects to hold an honorable position in his calling his education must be a continuous process.

It may be that the public will some time demand that there must be evidence of progress among civilian physicians as is required in the professional service of the Army and Navy.

The public is growing more intelligent about the resources of medicine. It may demand assurance of the standing of practitioners. The plans for the certification of specialists will we believe tend to promote better general medical practice.

### THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

BOCK, ARLE V. A.B., Ph.D., M.D. Harvard University Medical School 1915. Henry K. Oliver Professor of Hygiene, Harvard University. Physician, Massachusetts General Hospital. His subject is The Use and Abuse of Blood Transfusions. Page 421. Address: 15 Holvoke Street, Cambridge, Mass.

HAMILTON, ALICE. M.A., M.D. University of Michigan Medical School 1893. Assistant Professor of Industrial Medicine, Harvard University Medical School 1919-1935. Member, Health Organization of League of Nations 1924-1930. Consultant, United States Public Health Service and United States Department of Labor 1936-. Her subject is Some New and Unfamiliar Industrial Poisons. Page 425. Address: Hadlyme Ferry, Hadlyme, Conn.

JONES, CHESTER M. A.B., M.D. Harvard University Medical School 1919. Assistant Professor in Medicine, Harvard University Medical School. His subject is Newer Concepts of Liver Disease. Page 432. Address: Massachusetts General Hospital, Boston, Mass.

JOHNSON, ALLEN S. A.B., B.A., D.N.B., M.D. Harvard University Medical School 1927. F.A.C.P. Assistant Visiting Physician, Springfield Hospital. Visiting Physician, Health Department Hospital, Springfield. His subject is Sodium Chloride Therapy. Page 438. Address: 121 Chestnut Street, Springfield, Mass.

SPOULL, JOHN. M.D. Boston University School of Medicine 1901. His subject is A General Practitioner's Views on the Treatment of Angina Pectoris. Page 443. Address: 50 Merrimack Street, Haverhill, Mass.



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## SERUM TREATMENT OF ACUTE POLIOMYELITIS

DUE to the unusually low incidence of poliomyelitis in most of the country this summer, the perennial question of the efficacy of convalescent serum treatment has been relatively quiescent. One thing which has come of the recommendation of serum in the preparalytic stage of the disease is the recognition of an increasingly large percentage of nonparalytic cases. While it may be contended that a diagnosis cannot be made with certainty in the absence of paralysis, nevertheless the epidemiologic circumstances, the differentiation from other conditions and the similarity between the symptoms in the nonparalytic type and those in the preparalytic stage of the frank disease leave no doubt as to the nature of the former.

Harmon<sup>1</sup> in reviewing a number of papers in 1934, such as that of Kramer, Aycock, Solomon and Thenebe,<sup>2</sup> where the results in alternate treated and untreated cases were carefully measured, and the report by Park<sup>3</sup> of a large number of treated and untreated cases in New

York, came to the conclusion that there was no statistical proof of the value of any type of serum. It was pointed out, however, that the rapid symptomatic response, with drop in temperature and improvement in symptoms following administration of serum, was enough encouragement to warrant continuing its use. Perhaps it should be stated that these preparalytic symptoms in themselves do not appear to be sufficiently severe to justify drastic measures of relief. Furthermore, since there seems to be no correlation between severity of the early symptoms and paralysis, it does not follow that mitigation of symptoms would have any effect on paralysis. Moreover the problem of measuring the comparative outcome of treated and untreated cases presents many difficulties, for the reason that the extent of involvement cannot be foretold from any of the symptoms in the preparalytic stage. Even after paralysis has appeared, the amount of spontaneous recovery is likewise unpredictable and the time element here involved introduces a further obstacle. With these considerations in mind, the tendency to at least a degree of spontaneous recovery offers a great chance to the physician who has administered the serum with hope.

From a review of the now considerable literature on the subject, it would appear that the most definite, hopeful thing which has come out of convalescent serum treatment of poliomyelitis is the fact that a diagnosis of poliomyelitis in the preparalytic stage is no longer taken as meaning inevitable paralysis. With increasing attention to the early stage of the disease, an ever-increasing proportion of nonparalytic cases is being uncovered, now well over 50 per cent.

## REFERENCES

- 1 Harmon P. H. *Am J Dis Child* 47:1179 and 1216 (June) 1934.
- 2 Kramer S. D. Aycock W. L. Solomon C. I. and Thenebe C. L. *New Eng J Med* 206:432 (March 3) 1932.
- 3 Park, W. H. *J A M A* 89:1060 (Sept. 24) 1932.

## THE CERTIFICATION OF SPECIALISTS

FOR more than fifty years the medical profession has been trying to interest the laity in the important safeguards to well-being through efficient public health agencies and the service of well-trained physicians. Although some non-professional and public-spirited citizens have united with doctors in efforts to secure legislation which would raise the standards of medical practice, a proportion of the general public has been inclined to view with suspicion the recommendations of the profession to the several legislatures for laws which were designed to assure the people of competent practitioners of the healing art. The result is that even the best of the laws governing the licensing of physicians to engage in practice at the present time assure only average ability of the majority of

not propose to establish fixed rules for the preliminary training of candidates for certification in this field. Broad general principles for training, however, may be outlined, although such suggestions as are made must, of necessity, be subject to constant changes reflecting the dynamic nature of the specialty.

A sound knowledge of physiology, biochemistry, pharmacology, anatomy, bacteriology, and pathology in so far as they apply to disease is regarded as essential for continued progress of the individual who practices internal medicine. The more factual knowledge of medicine and its basic sciences is not sufficient. The candidate must have had training in their use in furthering his understanding of clinical medicine. This implies practical experience under the guidance of older men who bring to their clinical problems ripe knowledge and critical judgment. Preparation to meet this requirement adequately may be even more difficult to obtain than the so-called scientific training. It may, however, be acquired in the following ways:

- (a) By work in a well-organized hospital or outdoor clinic conducted by competent physicians.
- (b) By a prolonged period of resident hospital appointments likewise directed by skilled physicians.
- (c) By a period of training in intimate association with a well-trained and critical physician who has taken the trouble to teach and guide his assistant rather than to require him only to carry out the minor drudgery of a busy practice.

4. The Board does not consider it to be in the interests of internal medicine in this country that rigid rules as to where or how the training outlined above is to be obtained. Medical teaching and knowledge are international. The opportunities of all prospective candidates are not the same. Some may have the opportunity of widening their knowledge by a period of study abroad. Others, at the other extreme, may be restricted to a comparatively narrow geographic area and their detailed training must be obtained in short periods scattered over a long time. Although it is laid down that at least five years must elapse between the termination of the first interne year and the time when the candidate is eligible to take the examination, a longer period is advisable. The Board wishes to emphasize that the time and training are but means to the end of acquiring a broadness and depth of knowledge of internal medicine which the candidate must demonstrate to the Board in order to justify its certifying that he is competent to practice in internal medicine as a specialty. The responsibility of acquiring the knowledge as best he may rests with the candidate, while the respon-

sibility of maintaining the standard of knowledge required for certification devolves on the Board.

#### METHOD OF EXAMINATION

The examination required of candidates for certification as specialists in Internal Medicine will comprise Part I (written) and Part II (practical or clinical).

**Part I.** The written examination is to be held simultaneously in different sections of the United States and Canada and will include:

(a) Questions in applied physiology, physiological chemistry, pathology, pharmacology, and the cultural aspects of medicine.

(b) Questions in general internal medicine.

The first written examination will be held in December 1936 and candidates successful in this written test will be eligible for the first practical or clinical examination which will be conducted by members of the Board near the time for the annual session of the American College of Physicians at St. Louis in April 1937. The second practical examination will be held at Philadelphia near the time of the annual session of the American Medical Association in Atlantic City in June 1937.

The fee for examination is forty dollars which must accompany the application and an additional fee of ten dollars is required when the certificate is issued.

Application blanks and further information can be obtained by addressing the office of the chairman, Walter L. Biering, M.D., 406 Sixth Avenue, Des Moines, Iowa, U. S. A.

#### THE CHAIRMAN OF THE MASSACHUSETTS BOARD OF REGISTRATION IN MEDICINE

Dr. Francis R. Mahony of Lowell was elected Chairman of the Massachusetts Board of Registration in Medicine at a meeting of the Board August 28, 1936, to fill the position made vacant by the resignation of Dr. Charles P. Silvester.

Dr. Silvester's resignation was because of the necessity of adopting measures which will bring about restoration of his health. His service on the board has been recognized as highly meritorious and his reputation as a conscientious public servant is established.

#### EXCESS OF DEATHS OVER BIRTHS IN FRANCE

Deaths exceeded births in France during 1935 according to *La Science et la Vie*. Births during the year numbered 638,881 and there were 658,357 deaths—a morbidity excess of nearly 20,000. During 1934 births exceeded deaths by about 43,000. Unemployment and rising cost of living in France are blamed for the situation. At the same time Germany showed an excess of 480,000 births over deaths during 1935—*Science Service*.

WHITE, JAMES C. A. B. M. D. Harvard University Medical School 1923 F. A. C. S. Assistant Visiting Surgeon, Massachusetts General Hospital Assistant Professor and Tutor in Surgery Harvard University Medical School His subject is Progress in the Surgery of the Autonomic Nervous System in 1935 Page 453 Address Massachusetts General Hospital, Boston, Mass

## MISCELLANY

### THE AMERICAN BOARD OF INTERNAL MEDICINE (INC)

The American Board of Internal Medicine, incorporated February 28 1936, completed its organization on June 15 1936. The officers chosen were Walter L. Biering M. D., Des Moines Chairman; Jonathan C. Meakins M. D., Montreal, Vice-Chairman; and O. H. Perry Pepper, M. D., Philadelphia Secretary. These officers with the following six members constitute the present membership of the board: David P. Barr, M. D., St. Louis; Reginald Fitz M. D., Boston; Ernest E. Irons, M. D., Chicago; William S. Middleton, M. D., Madison; John H. Munser M. D., New Orleans; and G. Gill Richards M. D., Salt Lake City.

The term of office of each member will be three years and no member can serve more than two consecutive three year terms.

The organization of the Board is the result of effective effort on the part of the American College of Physicians in conjunction with the Section on Practice of Medicine of the American Medical Association and these two organizations are represented in the membership of the Board on a five to four ratio, respectively.

The American Board of Internal Medicine had previously received the official approval of the two bodies fostering its organization as well as that of the Advisory Board for Medical Specialties and the Council on Medical Education and Hospitals of the American Medical Association.

The purpose of the Board will be the certification of specialists in the field of internal medicine and the establishment of qualifications with the required examination procedure for such certification.

While the Board is at present chiefly concerned with the qualification and procedure for certification in the general field of internal medicine it is intended to inaugurate immediately after July 1 1937, similar qualification and procedure for additional certification in certain of the more restricted and specialized branches of internal medicine as gastroenterology, cardiology, metabolic diseases, tuberculosis, allergic diseases et cetera. Such special certification will be considered only for candidates who have passed at least the written examination required for certification in general internal medicine. The operation of such a plan will require the active participation and co-operation of recognized repre-

sentatives from each of such special fields of medicine.

Each applicant for admission to the examination in internal medicine will be required to meet the following standards:

#### GENERAL QUALIFICATIONS

- 1 Satisfactory moral and ethical standing in the profession
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#### PROFESSIONAL STANDINGS

- 1 Graduation from a medical school of the United States or Canada recognized by the Council on Medical Education and Hospitals of the American Medical Association.
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#### SPECIAL TRAINING

- 1 Five years must elapse after completion of a year's internship in a hospital approved for interne training before the candidate is eligible for examination.
- 2 Three years of this period must be devoted to special training in internal medicine. This requirement should include a period of at least several months of graduate work under proper supervision in anatomy, physiology, biochemistry, pathology, bacteriology, or pharmacology particularly as related to the practice of internal medicine. This work may be carried on in any domestic or foreign medical school or laboratory recognized by the Council on Medical Education and Hospitals of the American Medical Association as offering appropriate facilities for this type of postgraduate experience, or it may include a period of at least several months of graduate work under proper supervision in internal medicine or in its restricted and specialized branches in any domestic or foreign hospital, clinic or dispensary, recognized by the above Council as offering appropriate facilities for this type of postgraduate experience.
- 3 A period of not less than two years of special practice in the field of internal medicine or in its more restricted and specialized branches. The American Board of Internal Medicine does

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- The American Board of Internal Medicine does

of his native city and the Boston High School, he entered Tufts College and received his AB degree therefrom. He then entered Tufts College Medical School graduated in 1909, and served his internship in the Worcester City Hospital. He later became a member of the Surgical Staff.

Dr. Borden was a Fellow of the Massachusetts Medical Society and the American Medical Association. He was also a member of the American College of Surgeons, Quinsigamond Lodge, A. F. & A. M., and the Worcester Economic Club.

Dr. Borden is survived by his widow Mrs. C. I. (Bottomly) Borden, a daughter, Miss Elizabeth Borden of Worcester and two sisters, Mrs. Lillian Seamon of Andover and Miss Florence D. Borden of Boston.

**BURACK**—**ABRAHAM BURACK**, M.D. of 95 Waldo Street, Brockton, Massachusetts, whose office was at 142 Main Street, died at the Beth Israel Hospital, Boston, August 23, 1936, after a long illness.

Dr. Burack was born in Boston in 1889 and graduated from the Tufts College Medical School in 1912. He was a Fellow of the Massachusetts Medical Society and the American Medical Association.

His widow Mrs. Sarah Burack, and a son Jason Burack survive him.

**SMITH**—**FRANK HERBERT SMITH**, M.D. of Hadley, Massachusetts, died at his home August 23, 1936. Dr. Smith was born in North Hadley in 1871 and was educated at Hopkins Academy, Amherst College and the University of Pennsylvania School of Medicine where his medical degree was conferred in 1898.

After practicing in Philadelphia for two years, Dr. Smith returned to Hadley and established a large practice. He became physician to Amherst College in 1929. His health failed nearly a year ago and he retired from active work.

Dr. Smith was a Fellow of the Massachusetts Medical Society and the American Medical Association.

His widow Mrs. Grace Howe Smith, a son Myron Smith, an electrical engineer of Boston, and a daughter Eleanor Smith, professor of bacteriology at Smith College, survive him.

## NOTICES

### TERCENTENARY SESSION OF THE HARVARD MEDICAL SCHOOL

SEPTEMBER 14 AND 15, 1936

As part of the University celebration, the Medical School and the Medical Alumni Association invite the graduates of the School to return on September 14 and 15 for the Medical School Exercises and Medical Alumni Reunion. These will immediately precede the final Cambridge exercises on September 16, 17, and 18.

The Medical School Exercises will include

Demonstrations, special clinics, discussions and exhibits at the various hospitals associated with the Harvard Medical School.

Four carefully planned symposia programs presented by the Harvard Medical Faculty, on

Nutrition and the Deficiency Diseases

Chairman Dr. George R. Minot

The Nervous System, Central and Sympathetic

Chairman Dr. Walter B. Cannon

The Infectious Diseases

Chairman Dr. Hans Zinsser

The Endocrine Glands

Chairman Dr. J. Howard Means

The business meeting and the dinner of the Harvard Medical Alumni Association will be held on the evening of September 15 at the Harvard Club at 6:30 and 7 p.m. respectively. This meeting has been postponed from its usual time in June in honor of the Tercentenary and to encourage the return at this time of as many graduates as possible.

### PROGRAM OF THE TERCENTENARY SESSION OF THE MEDICAL SCHOOL

MONDAY, SEPTEMBER 14

9:00 a.m. 12:30 p.m. Clinics and demonstrations

The open house demonstrations and exhibits of the summer will be continued during this morning. The members of the staffs will be present to discuss their work informally and many of the departments and hospitals will offer special clinics and demonstrations. The full program will be announced at a later date in the Medical Alumni Bulletin.

12:30 p.m. Buffet luncheon in Vanderbilt Hall

2:00-5:00 p.m. Harvard Medical School Building D

Introduction to the Symposia

Dr. David L. Edsall, Dean Emeritus

*Nutrition and the Deficiency Diseases*

Chairman Dr. George R. Minot

Dr. J. L. Gamble—Extracellular Fluid and Its Maintenance

Dr. C. M. Jones—Protein Deficiency

Dr. C. W. Heath—Mechanism of Hemoglobin Deficiency

Dr. W. B. Castle—The Relationship of Defective Nutrition to Changes in the Gastrointestinal Tract

Dr. S. B. Wolbach—Vitamin C and the Formation of Intercellular Material

Dr. K. D. Blackfan—Progress in the Early Recognition of Vitamin Deficiency States

Dr. P. Howe—Oral Pathology in Relation to Avitaminosis

Dr. M. B. Strauss—Nerve Disorders Arising from Defective Nutrition

Dr. E. P. Joslin—Protamine Insulin and Its Advantages

5:00 p.m. Tea in the Medical School Quadrangle. Monday evening is held open for possible Medical class reunions and hospital reunions.

## OFFICERS OF THE NATIONAL SOCIETY FOR THE PREVENTION OF BLINDNESS

The reelection of Mr William Fellowes Morgan as President of the National Society for the Prevention of Blindness has been announced by Lewis H Carris Managing Director Other officers elected are Dr Francis Park Lewis of Buffalo N Y, First Vice President Mr Russell Tyson of Chicago Ill Second Vice President, and Mr Preston S Millar of New York City, Third Vice President

Mr Carris announced, also, that Dr Edward C Ellett of Memphis, Tenn, had been elected a member of the Society's Board of Directors, to succeed the late Dr William H Wilmer, of Baltimore Md Dr Ellett is a graduate of the University of Pennsylvania and has been a member of the American Ophthalmological Society since 1912

The annual conference of the Society will be held in Columbus, Ohio, December 3 to 5

## CORRESPONDENCE

### INDUSTRIAL CONDITIONS IN ENGLAND IN 1842—THE GRINDERS AND THE POTTERY WORKERS

Editor, *New England Journal of Medicine*

The following quotation is from the chapter 'March Past' in Edith Sitwell's book 'Victoria of England' (Faber and Faber Ltd, London 1936) The author pictures the different types of industrial workers marching past a given point

What is this terrible sound, as of multitudinous wooden shuttles, or air being driven through thousands of wooden tubes? What is this cloud of black dust, expectorated from dying lungs? It is the sound and symptom of the industrial disease from which the Grinders die

'In Sheffield,' wrote Dr Knight of that city 'there are some two thousand five hundred grinders at work About one hundred and fifty (eighty men and seventy boys) are fork grinders these die between the twenty-eighth and thirty second year The razor grinders, who grind wet as well as dry, die between forty and forty five years, and the table cutlery grinders, who grind wet, die between the forty fifth and fiftieth year' This comes from the sharp-edged metal dust particles freed in the cutting, which fill the air and are thus inhaled, and, too, from the bent position in which they must work, and in which the chest and stomach are cramped Here they come with their yellow faces their features expressing anxiety their rough hoarse voices and that loud cough, 'whose sound is as if air were driven through a wooden tube Dr Knight adds that he has often told grinders with the first symptoms of this disease that if they returned to work they would die It was useless for he who is once a grinder falls into despair, as if he had sold his soul to the devil

'What is this feeble sound this hopeless whispering of multitudes so faint it seems the despairing prayer of those about to die? It is the voice of

the Pottery Workers in the grip too of their industrial disease Here they come, twitching and writhing as if they were being agitated by some vast machine, some Moloch which folds them in its grasp Their work is to dip the finished pottery into fluid containing great quantities of lead or arsenic The hands, the clothing of these men, women and children are perpetually wet with this fluid the skin softens and is scraped away by the contact with hard or rough objects and their fate has them in its grasp for into these wounds, these soft places the lead, the arsenic is absorbed Violent pain, serious disease of the stomach and intestines, tuberculosis but most often epilepsy are the results Amongst men, partial paralysis of the hand muscles or paralysis of whole limbs, is frequent In one factory according to the same commission, four men all epileptic and affected with severe colic, and eleven boys, several of them epileptic, were found in the dippinghouse In those rooms of the potteries in which the stonework is scoured, the air is filled with the dust of ground flint which has the same result as the steel dust on the Sheffield grinder Breathelessness, inability to lie down, sore throat and a terrible cough—these are the result Un til at last they come to have so feeble a voice they can scarcely be heard They too, all die of tuberculosis'

Very truly yours,

WAR PEARCE COUES, MD

Prout's Neck, Maine,

August 25, 1936

### AN UNUSUAL SERIES OF TAPPINGS

August 10, 1936

Editor, *New England Journal of Medicine*,

I beg to report the following case Mrs W aged 75, weight 104 lbs afflicted with hypertrophic cirrhosis of liver, valvular disease of heart, and arteriosclerosis The first abdominal tapping was done August 15, 1930 The seventy-second tap was on July 12, 1936 Amount of fluid removed during these years was 144¼ gallons, weighing 1268 lbs She now requires tapping at about three week intervals, the average amount of fluid removed being 11½ qts and weighing 24 to 25 lbs

Mrs W suffers no pain, and is not confined to bed. She does her own housework and thinks nothing of a hundred mile ride in an automobile

Very truly yours,

ALBERT C LEACH MD

Orange, Massachusetts

## RECENT DEATHS

BOYDEN—ARTHUR HENRY BOYDEN, MD of 4 Nottingham Road whose office was at 390 Main Street Worcester, Massachusetts died at his home August 23, 1936 after a long illness Dr Boyden was born in Worcester September 29 1879 the son of Charles O Boyden and Sarah J (Kennington) Boyden After acquiring his early education in the schools



February 11—Dr Clarence A Bonner  
Superintendent Danvers State Hospital  
Subject Some of the Preventive Aspects of the  
Mental Health Problem

March 11—Dr Howard M Clute  
Surgical Chief Massachusetts Memorial and Car-  
neer Hospitals Professor of Surgery Tufts  
College Medical School  
Subject Problems of the Upper Abdomen

April 8—Dr Frank A Pemberton  
Surgical Chief Free Hospital for Women  
Subject Progress in Gynecology

May 13—Dr W Russell MacAnisland  
Assistant Professor of Orthopedics, Tufts College  
Medical School Trustee Canton School for  
Crippled Children  
Subject Some of the Recent Advances in Frac-  
ture Treatment

June 24—Dr Morris Fishbein  
Editor of the *Journal of the American Medical  
Association*, Chicago, Illinois  
Subject The Outlook for the Profession

### SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

#### CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, SEPTEMBER 7, 1936

Saturday, September 12—

\*10 a m - 12 m Staff Rounds at the Peter Ben-  
Brigham Hospital Conducted by Dr Henry A  
Christian

\*Open to the medical profession

September 7, 8 and 9—The Cancer Institute See page  
309 issue of August 13

September 7 10—International Union against Tubercu-  
losis See page 554 issue of March 12

September 7 11—American Congress of Physical Ther-  
apy will meet at the Waldorf-Astoria New York City  
See page 52 issue of July 2

September 9 to 12—Sixth Congress of the International  
Society for Urology For details address Dr Theodor  
Hrvntschak Rathausstrasse 3 Wien I

September 10 June 24—Pentucket Association of Phy-  
sicians See page 474

September 14 and 15—Tercentenary Session of the Har-  
vard Medical School See page 1166 issue of June 4 and  
page 473 of this issue

September 16 21—First International Congress of Sana-  
toria and Private Nursing Homes See page 503 issue  
of April 16 and page 264 issue of August 6

September 22 23 24—Twelfth Clinical Congress of the  
Connecticut State Medical Society See page 217 issue  
of July 30

October 12 18—Third International Congress on Malaria  
See page 1076 issue of May 21

October 19 23—Clinical Congress of the American Col-  
lege of Surgeons See page 150 issue of January 23

October 19 31—1936 Graduate Fortnight of the New  
York Academy of Medicine See page 1221 issue of  
June 11

October 20 22—Academy of Physical Medicine Annual  
Meeting Hotel Statler Boston

October 20 23—The American Public Health Association  
See page 1226 issue of June 11

December 3 5—Annual Conference of the National So-  
ciety for the Prevention of Blindness Columbus Ohio

March 30 April 2, 1937—First International Conference  
on Fever Therapy Postponement notice See page 62  
issue of July 2

April 21 24 1937—American Society for Experimental  
Pathology See page 1075 issue of May 21

### DISTRICT MEDICAL SOCIETIES

#### MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

October 7—Bear Hill Golf Club Stoneham.

November 18—Bear Hill Golf Club Stoneham

January 13, 1937—Bear Hill Golf Club Stoneham  
March 16 1937—Danvers State Hospital Danvers  
May 11, 1937—Bear Hill Golf Club Stoneham

KENNETH L MACLACHLAN M D Secretary  
1 Bellevue Avenue Melrose

#### PLYMOUTH DISTRICT MEDICAL SOCIETY

October 15—11 a m at the Moore Hospital Brockton  
FRED F WEINER M D Secretary  
231 Main Street Brockton

#### WORCESTER DISTRICT MEDICAL SOCIETY

September 23—At the Milford Hospital Milford Mass  
4 30 p m Visitation of the Milford Hospital unit which  
has been recently refurnished and added to 6 15 p m  
Dinner—complimentary by the hospital 7 30 p m Sci-  
entific program and business session The speakers for  
this meeting will be Dr Richard Miller and Dr Cadis  
Phipps of Boston who will give a symposium on Peptic  
Ulcer with Dr Miller discussing the surgical aspects  
and Dr Phipps the medical aspects of this condition

October 14—Rutland State Sanatorium Rutland Mass  
6 15 p m Dinner—complimentary by the State Hospital  
7 30 p m Business session and scientific program  
Speakers and subjects to be announced in a later issue  
of the Journal

November 5—At 4 30 in the rooms of the Worcester  
Medical Library Inc at 34 Elm Street Worcester will  
be held the fall Censors meeting

November 11—Grafton State Hospital North Grafton  
Mass 6 15 p m Dinner—complimentary by the hospital.  
7 30 p m Business session and scientific program

December 9—St Vincent Hospital Worcester Mass  
6 15 p m Dinner—complimentary by the hospital 7 30  
p m Business session and scientific program

January 13 1937—Worcester City Hospital Worcester  
Mass 6 15 p m Dinner—complimentary by the hospital  
7 30 p m Business session and scientific program

February 10 1937—Worcester State Hospital Worcester  
Mass 6 15 p m Dinner—complimentary by the hospital  
7 30 p m Business session and scientific program

March 10 1937—The Memorial Hospital Worcester  
Mass 6 15 p m Dinner—complimentary by the hospital  
7 30 p m Business session and scientific program

April 14, 1937—Worcester Hahnemann Hospital Worces-  
ter Mass 6 15 p m Dinner—complimentary by the  
hospital 7 30 p m Business session and scientific pro-  
gram

May 6, 1937—At 4 30 in the rooms of the Worcester  
Medical Library Inc at 34 Elm Street Worcester will  
be held the spring meeting of the Board of Censors

Wednesday Afternoon and Evening May 12, 1937—An-  
nual Meeting Time and place for this meeting will be  
announced in an early spring issue of the Journal

ERWIN C MILLER M D Secretary

27 Elm Street Worcester

### BOOKS RECEIVED FOR REVIEW

Studies from The Rockefeller Institute for Medical  
Research Reprints Volume 98 597 pp New York  
The Rockefeller Institute for Medical Research 1936

The Therapeutic Agents of the Pyrrole and Pyl-  
dine Group Including the Tropinol Scopoline Ecgo-  
nine and Granatoline Derivatives The Relation be-  
tween Their Chemical Constitution and Pharmacol-  
ogic Action W F von Oettingen 258 pp Ann  
Arbor Edwards Brothers Inc \$4 75

Pathological Physiology and Clinical Description  
of the Anemias. William Bosworth Castle and  
George Richards Minot Edited by Henry A. Chris-  
tian 205 pp New York Oxford University Press  
\$3 00

Interpretation of Laboratory Findings. Raymond  
H Goodale 170 pp Philadelphia F A Davis  
Company

Amino Acid and Ammonia Metabolism in Liver  
Diseases Esben Kirk. 147 pp Copenhagen Levin  
& Munksgaard Publishers

Heart Disease and Tuberculosis Efforts Includ

## TUESDAY, SEPTEMBER 15

Instead of two morning sessions and one after noon session as originally announced, there will be three simultaneous programs, each extending from 10 00 a. m. to 12 00 m. and from 2 00 to 4 00 p. m., at the Harvard Medical School

*The Nervous System, Central and Sympathetic*

Chairman Dr Walter B Cannon

- Dr J C White—Surgery of the Sympathetic Nervous System  
 Dr A Rosenblueth — Chemical Mediation of Nervous Effects  
 Drs J B Ayer and H R Viets—The Use of Prostigmine in Myasthenia Gravis  
 Dr H Davis—The Electrical Activity of the Human Brain  
 Drs F A Gibbs and W G Lennox—The Electrical Activity of the Brain in Epilepsy  
 Dr S Cobb—Cerebral Circulation  
 Dr S Weiss—Syncope and Collapse  
 Dr T J Putnam — The Pathogenesis of Multiple Sclerosis

*The Infectious Diseases*

Chairman Dr Hans Zinsser

- Dr Hans Zinsser—Recent Advances in the Study of Typhus Fever  
 Dr C F McKhann — The Immunological Application of Placental Extract  
 Dr W G Smillie—Epidemiological Studies on the Virus of Influenza  
 Drs C S Keefer and W W Spink—Immune Reactions in Gonococcal Infections  
 Dr A W Sellards—Yellow Fever  
 Dr C Lyons—Antibacterial Immunity in Hemolytic Streptococcal Infections  
 Dr E S A Robinson—The Antiserum Treatment of Pneumonia from the Standpoint of Public Health  
 Dr M Finland—Some Aspects of Pneumococcus Infection in Man  
 Dr R P Strong—Studies on Filarioides  
 Dr D L Augustine — Trichinosis, Incidence and Diagnostic Tests  
 Drs H Pickerton and G M Hass — Cultivation of Rickettsia in Tissue Culture

*The Endocrine Glands*

Chairman Dr J Howard Means

- Dr G B Wislocki — The Blood Supply to the Hypophysis  
 Dr H B Friedgood — The Nervous Control of the Anterior Hypophysis  
 Dr E C Cutler—Diabetes Insipidus Its Relation to Hypophysis and Thyroid  
 Dr J C Auh — Hypophyseal Parathyroid Relationships  
 Dr A B Hastings—Factors Governing the Calcium Equilibria of the Body  
 Dr F Albright — The Action of the Parathyroid Hormone upon the Skeleton

- Dr E D Churchill — The Surgery of the Parathyroids  
 Dr W T Salter—The Genesis of Thyroid Protein  
 12 30 p. m. Buffet Luncheon in Vanderbilt Hall  
 6 30 p. m. Business Meeting of the Medical Alumni Association at the Harvard Club  
 7 00 p. m. Dinner of the Alumni Association at the Harvard Club

## REMOVALS

ALEXANDER A. LEVI, M.D., announces the removal of his office from 485 Commonwealth Avenue to 481 Beacon Street, Boston Telephone Kenmore 8000

SELWYN L. STEEL, M.D., announces the removal of his office from 128 Chestnut Street to 320 Beacon Street, Boston Telephone Kenmore 8100

HORACE BINNEY, M.D., announces the removal of his office to 370 Commonwealth Avenue Boston. Telephone Kenmore 0306

SAMUEL L. GARGILL, M.D., announces the removal of his office to 481 Beacon Street, Boston. Telephone Kenmore 8000

## NOTICE OF MEETING

PENTUCKET ASSOCIATION OF PHYSICIANS  
1936 37

The place of meeting for September 10 and June 24 is 'Duck In Tel Merrimac 280 All other meetings at Hotel Bartlett, 95 Main Street, Haverhill. Tel Haverhill 3680 Hour of meeting 8 30 p. m. Dinner followed by address

September 10—Dr Donald Munro

Assistant Professor of Neuro Surgery, Harvard  
 Visiting Surgeon for Neuro Surgery, Boston City Hospital

Subject 'The Responsibility of the General Practitioner in Relation to Common Neuro Surgical Conditions'

October 8—Dr Arthur W Allen

Chairman Surgical Staff, Massachusetts General Hospital Vice-President, American College of Surgeons

Subject "Diseases of the Peripheral Vascular System

November 12—Dr W Richard Ohler

Internist, Boston City Hospital

Subject "The Clinical Interpretation of Laboratory Procedures'

December 10—Dr Horace K Sowles

Surgical Staff, Massachusetts General Hospital  
 Surgeon Faulkner Hospital

Subject Carcinoma of the Intestines'

January 14—Dr Samuel A Levine

Cardiologist Peter Bent Brigham and Beth Israel Hospitals

Subject 'Some Interesting Experiences of a Heart Specialist.'

the upper extremity, head and neck thorax lower extremity and vertebral column. As a review of standardized surgical procedures the book has merit but it can scarcely be said to be up-to-date.

**Studies from The Rockefeller Institute for Medical Research Reprints Volume 98** 597 pp New York The Rockefeller Institute for Medical Research 1936

This volume of reprints contains, among many others, a series of reports on the etiology of rabbit pox, equine encephalomyelitis and corvax of fowl. A further report of the studies by Page on nephritis is presented, as is an interesting report on pneumo thorax therapy in lobar pneumonia by Abernethy et al.

**Parenteral Therapy A Ready Reference Manual of Extra Oral Medication for Physicians Dentists Pharmacists, Chemists, Biologists, Nurses Medical Students and Veterinarians** Walton Forest Dutton and George Burt Lake 386 pp Baltimore and Springfield Charles C Thomas \$7.50

This book may be described as the how of medicine. Practically every technic requiring the use of the "needle" is described. Numerous illustrations clarify the text to a considerable extent. This portion comprising 160 pages should prove of value especially to practitioners whose interests are broad enough to include the various mechanical procedures employing the "needle" in diagnosis and therapy. In this effort the authors have been successful.

The remaining 200 pages are devoted to a therapeutic index and pharmacologic notes with particular reference to medicaments parenterally administered. To the reviewer it appears that much of this material is supererogatory, being a repetition of what may be found in textbooks of pharmacology yet lacking the conservative and judicious evaluation. There is far too great a tendency for physicians to resort to 'active' therapy. A great deal of this is the result of the constant bombardment by the pharmaceutical houses. It is to the detriment of this book that it makes little effort to neutralize this tendency to ampoule therapy. Considered by itself the first portion may be regarded the "rude mecum" of parenteral technic.

**A Guide to Psychiatric Nursing** F. A. Carmichael and John Chapman Second Edition, Thoroughly Revised 175 pp Philadelphia Lea & Febiger \$2.25

The authors would have done better to have thought out clearly the field of training to be covered and the group of students to be instructed and then written accordingly. As it is they jump from Freud to fleas and from excretions to ethics.

Although at birth the infant is anatomically though not sexually mature and therefore has no drive from the reproduction instinct he nevertheless has undifferentiated sexual wishes.

It is well to learn first-aid treatment and bandag-

ing from some source if no other is available. The Boy Scout Handbook contains a number of things that even seasoned nurses need to know.

With regard to the psychiatric treatment and nursing of patients there is a great deal to be stated but very little that is determined.

If this book is a primer for untrained attendants much of the reading matter is beyond their scope. If it is designed for nurses already trained in the ground work of physical care much of the reading matter might well be omitted. As in many fields of instruction, definition is necessary for elucidation. This book lacks definition and consequently stumbles in elucidation.

**Endocrine Tumours and Other Essays** Frederick Parkes Weber 207 pp London H. K. Lewis & Co., Ltd 7s 6d. net

Dr F. Parkes Weber has long been known in London for his wide knowledge of the bizarre and unusual in medicine. For years he has presented to the Royal Society of Medicine and other scientific bodies patients with rare endocrine, skeletal skin or neurological syndromes. Blood diseases have also been of special interest to him. His reports, widely scattered in medical journals have been repeatedly published in book form and are known to clinicians and students of medical history throughout the world. All have been of interest and many have thrown new light on some of the most obscure problems of medicine. The present volume is no exception. The longest essay (on endocrine tumors) although first published in 1929, and in 1933, has been brought up to date to include the literature of 1935. Other chapters deal with hereditary diseases, paroxysmal salivation, hypersplenism, Bierger's disease, chronic erythema of the legs and more general topics, such as classification of diseases, constipation, myths and dreams. These fifteen essays each a brilliant exposition of a phase of medicine are highly readable and instructive.

**Doctor of the North Country** Earl Vinton McComb 238 pp New York Thomas Y. Crowell Company \$2.00

This is a well written collection of the sort of stories from his personal experiences that the average busy physician could tell. McComb has an unusual sense of dramatic values so that he has made the very most of many a sordid and seamy situation.

The same painful yet humorous aspects of life with which many of us are all too familiar make a fabric permeated with the bright colors of a sensible idealism and self sacrifice.

The most interesting chapter is that dealing most sympathetically with a physician father and his influence on a plastic youth leading to the study of medicine.

The reader of this novel type of physician's personal narrative with its salty speech and life-like descriptions lays down the book with honest regret.

ing Methods of Diaphragmatic and Costal Respiration to Lessen Their Prevalence S Adolphus Knopf 108 pp New York The Livingston Press \$1.25

Orthopaedic Surgery Walter Mercer Second Edition 906 pp Baltimore William Wood & Company \$10.00

The Toxaemias of Pregnancy Dame Louise McIlroy 355 pp Baltimore William Wood & Company \$5.00

The Operations of Surgery R P Rowlands and Philip Turner Eighth Edition, Volume I 1045 pp Baltimore William Wood & Company \$10.00

Report of the Penrose Research Laboratory Formerly Laboratory and Museum of Comparative Pathology of the Zoological Society of Philadelphia Herbert Fox 30 pp 1936

The Oxford Medicine By Various Authors Edited by Henry A. Christian 634 pp New York Oxford University Press \$10.00

Vascular Disorders of the Limbs Described for Practitioners and Students Sir Thomas Lewis 111 pp New York The Macmillan Company \$2.00

Endocrinology in Modern Practice William Wolf 1018 pp Philadelphia and London W B Saunders Company \$10.00

A Text Book of Physiology H E Roaf Second Edition 679 pp Baltimore William Wood & Company \$6.75

Pathology of the Nervous System J Henry Biggart 335 pp Baltimore William Wood & Company \$5.25

A Preface to Nervous Disease Stanley Cobb 173 pp Baltimore William Wood & Company \$2.50

## BOOK REVIEWS

Synopsis of Diseases of the Heart and Arteries George R Herrmann 344 pp St Louis The C V Mosby Company \$4.00

This volume is unique among American publications in the field of cardiology. Although its title indicates that it is a "Synopsis" and the author describes it as an indexed epitome of the principles and modern conception of cardiologic practice, it is amazing how much useful material is contained in such a small and readable handbook. All the common cardiovascular conditions are adequately discussed. This even includes chapters on electrocardiography and cardiologic roentgenology and peripheral vascular disease. The various instruments and methods of study are taken up such as the oscillometer and the determination of the venous pressure. The numerous illustrations and figures are extremely well chosen and add a great deal to clarify both the pathologic and the physiologic aspect of the subject.

Students and practitioners, for whom this book is primarily intended, will be amply rewarded for the time spent in reading the various chapters and may even use it for reference purposes when puzzled by

the application of certain specific procedures of cardiovascular study or therapy.

Security Against Sickness A Study of Health Insurance I S Falk 423 pp New York Doubleday, Doran & Company, Inc \$4.00

The author of this book is well qualified from long study of the subject to discuss health insurance. The factual data on the organization of medical practice are well presented but do not give any new information although some of the figures are brought up to date. There is an excellent summary of health insurance in the leading countries of Europe. These factual data cannot be questioned as to their accuracy.

The last section of the book is entitled 'Basic Principles for an American Program' and this is by all means the most interesting portion of the book as it consists largely of a critical discussion of the possible principles for health insurance in this country. The book concludes with a statement of nineteen basic principles which should be considered in developing an insurance plan for the United States. The author emphasizes repeatedly that "health insurance is not a system of medical practice. It is a system of paying costs of sickness through budget and pre-payment."

The author frankly assumes that health insurance will be adopted in this country eventually. One may not agree with this point of view but the book is well worth careful reading even by those who do not accept the author's conclusion.

The Operations of Surgery R P Rowlands and Philip Turner Eighth Edition Volume I. 1045 pp Baltimore William Wood & Company \$10.00

This book is intended as an aid to candidates for higher degrees of surgery in England and as a reference book for those who practice surgery. The former purpose makes for misplaced emphasis and infrequently practiced operative procedures are given a considerable space because of their purely academic importance. Thus 13 pages are devoted to 'Excision of the Elbow' and only five to 'Infections of the Hand'.

The authors have rewritten the previous edition of this work and endeavored to incorporate recent advances but on a number of points the literature could not have been consulted widely. Cushing's statistics on operative mortality for patients with brain tumors are those of 1915 rather than those of late publication. The most recently quoted paper on pericardiolysis is one in 1915 despite the fact that Paul White reviewed his and Churchill's series in the *Lancet* only last year.

American surgeons will take exception to many of the teachings in this book. The statement that in early cases of true primary toxic goiter operation is not indicated will find few proponents among goiter surgeons in this country.

The first volume of the present edition deals with

# The New England Journal of Medicine

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## THE PATHOGENESIS OF CIRCULATORY FAILURE\*

BY TINSLEY R. HARRISON, M.D.<sup>†</sup>

NEW England physicians who are interested in disorders of the circulation may well be proud of their intellectual heritage. It was here that Henry P. Bowditch discovered one of the most fundamental properties of cardiac muscle and expressed it in his "all or none" law of contraction. From Boston emanated the first clear exposition of our present knowledge of the important underlying causes of cardiac disease. In New England the rapid advances made in the first decade of the present century in the understanding of the arrhythmias were applied, amplified and taught. Here the treatment of angina pectoris by nerve injections was popularized, the courageous surgical attack on chronic valvular disease was instituted, the medical recognition and the surgical treatment of obliterative pericarditis were extended, the importance of masked thyrotoxicosis as a removable cause of heart disease was recognized, the great value of digitalis in many patients with regular cardiac rhythm was successfully defended, the role of adrenalin and adrenalin-like substances in the control of the heart rate was demonstrated, the velocity of the blood flow in health and disease was measured, the syndrome of left ventricular failure was clarified, carotid sinus syncope was discovered, and complete ablation of the thyroid gland for cardiac invalidism was initiated. In Boston young physicians from other parts of the country have been made "heart-conscious" and have been stimulated to continue the application of modern methods and rational concepts to their investigations, teaching and practice. The work still goes on and one can confidently predict that contributions from this locality to the problems of circulatory disorders will be as significant in the future as in the past. In view of these facts one experiences a peculiar sensation on coming to Boston to talk about the heart. One feels like the mountain visiting Mohammed or Birnam Wood approaching Dunsinane. It seems unnatural and unorthodox but not unpleasant.

In any consideration of circulatory failure it is of importance that disturbances originating in the heart be clearly distinguished from those

of peripheral origin for these two groups of disorders differ from each other as regards the underlying physiologic alterations, the clinical picture produced and the methods of treatment to be applied.

### PERIPHERAL CIRCULATORY FAILURE

The clinical picture of peripheral circulatory failure (shock collapse) is characterized by weakness as the chief subjective phenomenon and by ashen pallor, cold clammy skin, tachycardia, weakness of the pulse, diminution in systolic pressure followed at a later stage by a decline in the diastolic pressure as well and in certain instances by faintness of the heart sounds, which often resemble each other in quality. This symptom complex may be the result of several different mechanisms. The *hematogenic* type is due to a primary diminution in the circulating blood volume and is most clearly exemplified by acute hemorrhage. It is also observed in conditions of severe dehydration from vomiting, diarrhea or excessive sweating. Diminution in blood volume also plays an important rôle in the mechanism of traumatic shock (secondary shock) because of loss of blood and blood plasma from the blood stream into the injured areas. The *neurogenic* type of circulatory failure is brought about by influences which affect the blood vessels through the nervous system and is illustrated by simple fainting as well as by the syncope induced by carotid sinus pressure and by the effects of spinal anesthesia. In these conditions the blood volume may remain normal but the blood pressure is reduced as a result of vascular dilatation. We also have the *vasogenic* type of peripheral circulatory failure which is brought about by agents such as histamine which cause vascular dilatation by direct action on the vessels. The mechanism of certain other types of acute circulatory failure is as yet unknown. This is particularly true of the collapse associated with severe infections and that which accompanies peritonitis.

Regardless of the initiating agent the fundamental mechanism in these various disorders of the peripheral circulation is a diminution in the venous pressure, decline in the output of the heart and inadequate blood supply to the tissues. In the interpretation of the mechanism of heart failure it is important to remember that the clin-

\*The Henry Jackson Lecture delivered before the New England Heart Association, April 29, 1936.

<sup>†</sup>Harrison, Tinsley R.—Associate Professor of Medicine, Vanderbilt University, 1932. For record and address of author see "This Week's Issue," page 50.

**Pediatric Treatment** A manual of the treatment of the diseases of infants and children designed as a reference work especially for the General Practitioner and Physicians entering the field of pediatrics Philip S Potter 578 pp New York The Macmillan Company \$5 00

This is a treatise on pediatrics with special emphasis upon treatment The text consists of 540 pages with fifteen pages of additional prescriptions It is divided into four sections as follows (1) Therapeutic Procedures (2) Nutrition, (3) Treatment of the Diseases and Abnormalities of the Newborn (4) Treatment of Disease, which in turn is divided into the various body systems

The author has recognized a definite need in attempting to present in logical order the fundamentals of pediatric treatment for the general practitioner — a most difficult task He has incorporated, however so much that is unimportant, compiled from his personal experience and from textbooks, that the book fails in its real purpose Acute bronchitis for instance, is treated in three stages with suggested drugs a practice which for the most part has been found unnecessary The same criticism is made of the chapters on artificial feeding which contain many impractical statements, such as,

Certified milk is the only milk which can be used with comparative safety in large communities' and milk sugar is preferable in normal conditions of infant feeding

This book does contain many valuable therapeutic suggestions both old and modern and is an excellent reference for a physician with experience and a critical opinion It lacks a chapter upon the subject which concerns the practitioner most namely child behavior

**Pediatric Nursing** John Zahorsky 568 pp St Louis The C V Mosby Company \$3 00

Dr Zahorsky advocates not only a thorough knowledge of the procedures and technics necessary for the intelligent care of an ill child but a detailed knowledge of the growth development and management of the normal well child The first chapters of his book deal briefly but concisely, with this aspect of pediatrics Following this is a chapter stressing the prevention of diseases in baby and childhood which is most commendable, and a phase which is all too often left unmentioned in textbooks for nurses Dr Zahorsky also devotes a chapter to the importance of training a pediatric nurse to observe not only symptoms and abnormalities of sickness but the signs and features of the well and normal child

Next, he takes up the diseases of infancy and childhood grouping them under several headings, such as Diseases of Digestive System Respiratory Organs Bones and Joints, Deficiency Diseases and so forth This part of the book seems to be a little too brief Each disease is disposed of in a paragraph or two, and for this reason its value as

a textbook would seem limited The inclusion of the common contagious diseases of childhood is an excellent feature

The chapters given over to the equipment and materials needed in a pediatric unit of a hospital seem somewhat unnecessary in a book of this type and the space used for this could be more profitably used in giving a more detailed picture of the common and serious illnesses a nurse would encounter in her care of babies and children.

The final chapters of the book devoted to procedures used not only in the hospital but in the home as well are of very great value and well presented The illustrations are numerous well chosen and are assets to the book as a whole

The book seems especially adapted for a reference book for the graduate nurse but anyone—student nurse graduate nurse, or even a lay person—who is caring for a child or children will find a great deal of assistance and value in this book.

**Principles and Practice of Recreational Therapy for the Mentally Ill** John Eisele Davis In collaboration with William Rusb Dunton, Jr 206 pp New York A S Barnes & Company \$3 00

Although occupational therapy has long played a valuable part in treating the mentally ill organized recreation with the same aim in mind has never been adequately recognized The author of this book, who has had wide experience in a veterans hospital for mental disease has for the first time brought together the details of recreational therapy The opening chapter is an excellent résumé of the types of disease found in a mental hospital This is followed by details of recreational activities with particular attention given to those types of play which are best suited for patients with dementia praecox encephalitis paranoia, etc The author does not attempt to evaluate the effect of recreational therapy he simply states the essence of the various games and tests and in the final chapter outlines the aims and objectives This book extremely well written, will serve as a foundation for work in many hospitals Ultimately we shall be able to draw some conclusions in regard to whether or not such detailed recreational work is worth while

**Bewildered Patient.** Marian S Newcomer 323 pp Boston and New York Hale Cushman & Flint \$1 75

The bewildered patient tends to dramatize too strongly the very information medical men would like their patients to have Much of the material has already been published in lay magazines where it is more certain to be found by the average lay man Like many in the flood of books by doctors pouring out today it would be far better as a simple pamphlet, without the 'school ma'am' attitude that most women doctors exhibit

to correlate clinical concepts of heart failure with the general principles of cardiac physiology which have been arrived at by experimentation. When heart failure has been studied under controlled conditions such as exist in the heart-lung preparation it has been found to be intimately associated with dilatation which is the heart's method of increasing its expenditure of energy. A healthy heart responds to effort by dilatation and this is accompanied by increased work. An impaired heart responds to injury or strain by dilatation in order to maintain its previous level of work. In the latter conditions the mechanical efficiency of the heart suffers and it is this inefficiency which is the cardinal physiologic change in heart failure. This has been demonstrated in the heart-lung preparation and also in intact animals in experiments in which the work of the heart and its oxygen consumption have been measured by indirect methods. Since dilatation is an almost constant finding in congestive heart failure in patients, it appears that here the cardinal physiologic change is an increase in the energy expended without an increase in the work performed. Indeed the latter is usually decreased. Properly speaking congestive heart failure is a matter of inefficiency rather than insufficiency of the myocardium. The evidence obtained from physiology, like that from pathology and clinical medicine, accords well with the general concept of backward failure.

#### RELATION OF CARDIAC HYPERTROPHY TO CARDIAC FAILURE

When the heart is subjected to chronic strain or is the seat of extensive disease the muscle fibers often hypertrophy. By analogy to skeletal muscle one would expect the hypertrophic fibers to be stronger. This is probably true provided the hypertrophy does not proceed too far but there seems no doubt that when sufficiently marked this initially compensatory process may be a disadvantage. Various explanations have been advanced for the tendency of hypertrophic hearts to fail. The idea that the blood flow may become inadequate because of the failure of the capillary bed to enlarge can scarcely be the whole story when one remembers that in the normal heart the volume of the coronary blood flow may readily increase five to ten fold under conditions of stress. Another explanation which has been offered concerns the rate of oxygen diffusion into the muscle fibers. When we recall that the flow of blood through the muscle of the left ventricle takes place mainly during diastole and that the blood remains in the cardiac capillaries for only a fraction of a second and that oxygen diffusion does not occur instantly but requires a definite interval of time, it would appear that either

a marked augmentation of the heart rate with consequent diminution in the duration of diastole or a too great increase in the distance to which oxygen must diffuse might interfere with the complete oxygenation of the central portions of the muscle fibers and hence with the recovery process. This general line of reasoning has served to explain why small animals with thin cardiac muscle fibers may have normal heart rates of 300 or more, why heart failure occurs in persons with structurally normal hearts during prolonged bouts of paroxysmal tachycardia, why moderate increase in rate may precipitate congestive failure in persons with slight cardiac hypertrophy, and why failure may exist at a normal heart rate in persons who have marked cardiac enlargement. These considerations are strengthened by calculations based on the known laws of oxygen diffusion which indicate that the oxygen tension of arterial blood is insufficient to cause oxygenation of the thickest fibers seen in hypertrophic hearts in the time available during diastole. It must be remembered that the rate of oxygen transported through tissue diminishes progressively in a way not unlike the rapid decline in the speed of a bullet passing through the animal body.

In conclusion Failure of the circulation is of two general types which may coexist but usually occur separately. The forward type of circulatory failure usually involves primarily the peripheral vascular apparatus but is occasionally due to disorders of the heart. The clinical picture is that of collapse and is brought about by inadequacy of the tissue blood supply. The backward type of circulatory failure is dependent on chronic disease of the heart which leads to a rise in venous pressure, either in the pulmonary or systemic vascular bed or in both of these areas, and produces the clinical picture of congestive heart failure. It is of interest to recall that the greatest of all students of the cardiovascular system, William Harvey, 300 years ago arrived at the same conclusions which have been established by modern research. Harvey wrote "If a live snake be cut open the heart may be seen quietly and distinctly beating for more than an hour, moving like a worm and propelling blood when it contracts longitudinally, for it is oblong. It becomes pale in systole, the reverse in diastole, and almost all the other things we have mentioned as proving the truth may be clearly observed for here all happens slower and more distinctly. This especially may be seen more clearly than the midday sun. The vena cava enters at the lower part of the heart the artery leaves at the upper. Now pinching off the vena cava with a forceps or between finger and thumb, the course of blood being intercepted some distance below the heart, you will see that the space between the finger and the heart is drained at once, the



ical picture produced by insufficient blood supply to the tissues is the picture of shock or of collapse

#### HEART FAILURE

There are two types of heart failure which may occur either singly or in combination. Acute cardiac collapse occurs in certain instances in which there is grave and usually sudden disturbance of myocardial function. The clinical syndrome is similar to that of peripheral circulatory failure except that the veins which are empty in the latter may be distended in the former. Examples of this type of heart failure may be seen in some of the following disorders: paroxysmal tachycardia, coronary thrombosis, diphtheritic myocarditis, complete heart block, effusion into the pericardium, and in more chronic form in persons with constrictive pericarditis. Sudden death occurring in persons with angina pectoris as a result of ventricular fibrillation or of cardiac standstill illustrates this type of heart failure appearing in its most dramatic and extreme form.

The term *congestive heart failure* should be reserved for a clinical syndrome characterized either by congestion in the pulmonary vascular bed (left-sided failure), accompanied by dyspnea, diminution in vital capacity, cough and râles in the lungs, or by engorgement of the systemic vascular bed (right-sided heart failure), associated with venous distention, enlargement of the liver, edema, albuminuria and cyanosis. (Of course the manifestations of pulmonary and systemic congestion may and often do occur together.) Concerning the pathogenesis of this symptom complex, two general concepts have been advanced. One of these, which has been widely accepted by the clinicians of the English speaking countries, attributes this syndrome to "forward failure", i.e., to diminished blood supply to the tissues as the result of an inadequate cardiac output. According to this concept dyspnea must be ascribed to deficiency of blood flow to the centers in the brain, while edema, the other most striking clinical manifestation of the syndrome, is explained by an increase in capillary permeability dependent on deficiency of the peripheral blood supply. However, in recent years, convincing evidence against this hypothesis has been accumulated. It has been shown for instance that the picture produced by decline in the output of the heart is, as has been discussed, that of shock or collapse and not that of congestive heart failure. Furthermore although many patients with the latter syndrome are found, when studied by modern methods, to have a diminution in the amount of blood pumped by the heart per minute, the degree of diminution is often slight and no greater than that seen in an oc-

casional normal individual. It has also been shown that improvement from congestive heart failure is not associated with constant changes in the output of the heart.

Analysis of the arterial blood and of the venous blood returning from the brain of dyspneic patients has failed to reveal the alterations in blood gases which are postulated by the "forward-failure" idea. The fact that the edema fluid of patients with congestive heart failure is ordinarily poor in protein indicates that diminished tissue circulation with consequent increase in capillary permeability is not the chief factor responsible for the dropsical tendency of patients with congestive heart failure. The evidence against the "forward failure" hypothesis appears therefore to be conclusive.

The alternate theory, that of "backward failure", attributes the manifestations of congestive failure to a rise in pressure in the veins and capillaries in those areas which feed blood toward the failing side of the heart. This concept, which was hinted at by Corvisart and by Bertin, and was first clearly formulated by Hope, has been generally accepted by pathologists and by the Continental clinicians and is supported by much evidence. At the autopsy, table congestion of the lungs is usually found in association with dilatation (which is the anatomic concomitant of failure) of the left side of the heart, while systemic congestion is ordinarily associated with dilatation of the right side of the heart. On the clinical side it has been shown that the edema of heart failure is regularly accompanied by an increase in the systemic venous pressure, this increase being transmitted back to the capillaries and being responsible for the greater transudation of fluid through their walls. Cardiac dyspnea is a complex symptom and many different elements play a rôle in its causation. However, the most important factor is congestion of the lungs which can be recognized by the diminution in vital capacity, and which produces reflex stimulation of breathing through the afferent vagal fibers from the lungs. Dyspnea is therefore due in the main to back pressure from the left side of the heart just as edema is due to back pressure from the right side of the heart.

The chief objection which has been raised to the "back pressure" hypothesis rests on the assumption that this concept necessarily implies regurgitation through stretched or diseased atrioventricular valves, while the signs indicative of such regurgitation are absent in many of the patients. However, this objection is invalid for it is based on a misconception, back pressure may be the result of resistance to filling due to the accumulation in the ventricle of residual blood from dilatation.

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Such rapid advances in the use of x-ray have changed incredulity into a belief, which at times goes beyond the physical laws governing this form of energy. One cannot blame the public for requesting an x-ray to show the cause of pain or for "wanting an x-ray all over" to see if their condition is good. But it shows how far belief has gone beyond the facts when recently a successful physician in a neighboring city brought to me a patient much out of breath and somewhat cyanotic, saying he knew she had valvular heart disease but wanted me to use the x-ray to see just how badly the valves were affected. Or in another case a physician had been told by an artist that the little chain of bones in the middle ear of a patient had been destroyed and he wanted a picture to show the patient the exact condition of these bones—as it were to prove the case.

The purpose of this paper is to call attention to a few of the things expected at times of the x-ray that it will not do.

We must remember the x-ray is a form of energy governed by physical rules that never vary. The resulting x-ray varies in quality uniformly as certain component factors are changed in its production. Voltage, time, distance and intervening substances (called filters) change the result but with the same rearrangement the same results can be reproduced again. I am submitting the fact to you that x-rays are constant and the results will be constant. It is the patients that vary and the person interpreting the plates does not always realize this.

No changes can be detected for example in bone disease until alterations have taken place either in the structure or chemical constituents or of the contents of the bone cells. An example of this is early osteomyelitis. The patient is ill, with fever and pain in a single extremity and still a negative report must be given from any early radiograph taken. No bone changes have occurred and none will occur in some cases for a few days after which the radiograph will show such extensive disease that it seems too bad the oncoming changes could not have been at least suspected in the original examination.

In the same way most gall stones cannot be seen in the plain plate as the atomic weight of the stone so closely resembles that of the sur-

rounding bile. Even the use of various preparations to be secreted with the bile to change the weight of this fluid leaves a good 10 per cent undiscovered. In my belief the function of the gallbladder is in most cases, when not accompanied by severe pain, more important than knowing of the presence or absence of stones. I think in these cases, as well as in gastrointestinal cases, we can learn much from the attitude of the practitioner toward the roentgenologist in Europe. The American's proverbial haste is present in our work here. In Europe it is not unusual to have a second or third confirmatory examination made before final action is taken. This is done without reflection on the x-ray examination as the inconstant factor of the patient is always recognized. Functions vary and it is only the constant defect that should be considered disease. While it is well known that twenty-four hours are required for a complete gastrointestinal examination the referring physician will often call up within a couple of hours after the beginning of the examination and want to know what was found in the intestines as well as in the stomach. The patient has been ill for months and the x-ray diagnosis is supposed to be available in two hours! Again let me ask for more time, more study of the case, more re-examination without reflection on the roentgenologist and with material benefit to patients by producing nearer 100 per cent correct diagnoses. It should always be kept in mind that the patient is the only one to be considered. If a re-examination will change possibility into probability and even into certainty thus saving an expensive and to a degree dangerous exploratory operation let the referring surgeon uphold us in our demands for more accuracy even at a time loss.

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blood being emptied by the heart beat. At the same time the heart becomes much paler even in distention from lack of blood, and beats more slowly, so that it seems to be dying. Immediately on releasing the vein, the color and size of the heart return to normal.

"On the other hand, leaving the vein alone, if you ligate or compress the artery a little distance above the heart, you will see the space between the compression and the heart, and the

latter also, became greatly distended and very turgid, of a purple or livid color, and, choked by the blood, it will seem to suffocate. On removing the block, the normal color, size, and pulse return.

"This is evidence of two kinds of death, failure from a lack, and suffocation from excess. In these examples of both, one may find proof before his eyes of the truth spoken about the heart."

## The Massachusetts Medical Society

### SECTION OF RADIOLOGY AND PHYSIOTHERAPY

Municipal Auditorium, Springfield, Monday, June 8, 1936

#### PRESIDING

Dr Philip H Cook, Worcester Chairman.

Dr William G Curtis, Wollaston, Secretary

CHAIRMAN COOK. I would like to announce that the program today has been made up with special reference to the general practitioner. We wish to enhance the understanding that exists between the general practitioner and the specialist to whom he sends his work. In times past there may have been some misunderstandings, and we would like to

straighten those out as far as we can. It seemed best under those circumstances not to have a formal discussion after these papers, with one exception, but to have question periods and consequently we will ask anybody in the audience who desires to ask questions to do so, and I hope you will all feel free to question the speakers. The first paper on this program is "The Limitations of the Roentgen Method of Diagnosis," by Dr Harvey W Van Allen of Springfield.

### THE LIMITATIONS OF THE ROENTGEN METHOD OF DIAGNOSIS\*

BY HARVEY W VAN ALLEN, M D †

PROBABLY not more than half of the audience here remember the advent of the x-ray and not a quarter of those present were in medical practice at that time. It is interesting to have been connected with this specialty since its earliest days,—a period in which x-rays were looked upon as a very questionable aid in any diagnostic procedure and almost outside the realm of legitimate medicine as a form of treatment. In those early days we congratulated ourselves that "everything was working well" when we got a picture of a hand in one minute and a hip, if not too large, in ten minutes. At best, however, they were only silhouettes, showing no bone detail and a fracture, if present, was detected only by an irregularity in the contour and not by seeing a line of fracture.

The first hospital x-ray apparatus in Springfield was presented by a patient of mine and it was with the greatest difficulty that a location was found for it. None of the departments wanted to give the apparatus room. Finally it was electrically connected in an abandoned linen

closet in the operating wing. We were not expected to do more than confirm the surgeon's clinical diagnosis of fracture or the presence or absence of a large, x-ray opaque, foreign body. When there was a difference of opinion the surgeon settled the matter by assuming he was correct. For example, a little old cobbler shot himself in the mid-chest. The large wound entrance was there and no wound of exit. The x-ray failed to locate the bullet. This was not looked upon as too remarkable, but as additional proof of the unreliability of the new method. The bullet must be in the chest, witness the wound of entrance and none of exit. It was only when the patient was dismissed from the hospital as a rather good recovery from such a serious injury that the bullet was found in his shoe, having struck the sternum, bounced back into his clothing, to find a resting place in his shoe and there to remain until he was dressed in street clothing again.

From these early days the usefulness of the x-ray has rapidly advanced,—largely by increased electrical, photographic and mechanical improvement, until now there is no specialty which serves so many branches of medicine as this application of the discovery of Professor

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†Van Allen, Harvey W.—Chancellor, American College of Radiology. For record and address of author see "This Week's Issue," page 507.

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surrounding cavities. Cartilage does not in the usual way cast x-ray shadows, hence requests for diagnosis of fractures of the costal cartilages, semilunar cartilages of the knee and so forth should not be made. Fracture of the wrist of the small infant must be left to the surgeon. The time of the development of the nasal accessory sinuses varies somewhat but when a demonstration is requested before the average time of the development of the sinuses the opinion expressed should be most guarded. I recall an evening emergency case of frontal sinus trouble taken by my technician in my absence and diagnosed by the able attending physician as fluid-filled, as the sinuses did not show. The parents and child were on the sleeper awaiting departure for New York to a "Herr Professor" when I, returning from the theater, saw the plates, inquired the patient's age and, as it was such that the frontals were not formed yet, the trip was hastily abandoned and the case recovered without operation.

In speaking of children, the diagnosis of malarial disease is difficult, as many times both sides are affected and we lose the advantage of comparison. However, we have recently been at quite an advantage in another way as our new machines enable us to take instantaneous films and thus overcome one of our greatest difficulties of obtaining immobility with the child lying on a tender ear.

There is often a little dissatisfaction shown by the referring physician when a negative report is returned. It is more difficult to produce films on which negative reports can be made with certainty than positive reports. A very poor plate may show a fracture but to say there is no fracture, even of an obscure type, the film must be excellent. So, for example, the negative report as to gallbladder shadow in the Graham test is of the greatest value as an indication of disease, but the film, to make such a diagnosis, must be capable of showing the most delicate shadow. We must have some definite rule that such a plate, to pass our criticism, must show clearly such permanent things as the edge of the psoas muscle and the border of the liver.

It is difficult at times not to put too much significance upon positive findings. There are many defects detectable by x-ray that are not the cause of the symptoms complained of. How often can hypertrophic deposits be seen on the spine of men over fifty with no symptoms, but if the man has backache, say from a kinked ureter, do we attribute the pain to the demonstrated arthritis and not question the undemonstrated ureter?

This leads me to introduce another discussed question—"Should the roentgenologist have

the history of the case?" The argument against having him know the past condition of the patient is that he will read this knowledge into the diagnosis, though if he does know he will be better able to employ the indicated technique and decide what plates to take. I am strongly of the opinion that the history should be known to the roentgenologist so that he may use the best technique for the particular lesion. Future reexamination can be more effective for diagnosis if films are carefully preserved for comparison. This is the duty of the roentgenologist. It has been long since decided legally, as well as by good roentgenologic practice that the films are the permanent property of the roentgenologist, and the patient or his physician is only entitled to our report on a study of the plates themselves in the laboratory. Courtesy and good judgment sometimes make other practice advisable, but the films cannot be demanded.

A word as to treatment. X-ray as a remedy has now made for itself a very staple and accurate place. Gone are the days when an exposure to the ray is made with no thought of the voltage, distance or area to be covered. Proper technique now demands that every measurement should be adjusted as carefully as the pharmacist fills a carefully written prescription. The wrong use of the ray can be as serious as the wrong use of the surgeon's knife. This is true in a negative as well as a positive way. The roentgenologist who, through fear of a burn or lack of knowledge of his machine, gives too small a dose to be "safe" is as bad as the surgeon who fails to carry his operation far enough to reach the disease. We do not dictate to the surgeon just what method he shall adopt in his operating room, and it is equally absurd for a surgeon or medical man to indicate the kind of x-ray or the number of treatments required. The surgeon who refers a patient for postoperative radiation, asking us to give it "a couple of shines", not only belittles himself for requesting such a slipshod aid but makes it almost impossible to get the patient to look upon our efforts as a life saving, serious matter. Again, I have had patients advised by the surgeon to discontinue deep therapy because in some it produces nausea. The fact that we are treating a serious disease, without other remedial resources, should make a simple discomfort of minor importance. We are trying to save a life. The surgeon does not abandon his operation because the other causes nausea. I am asking for reference of treatment cases with no strings attached but with a confidence that a properly prepared roentgenologist will apply a powerful and potent remedy with the same thought and skill in his specialty that is used in surgery or medicine.

In this simple way I have tried to emphasize

the need of considering the limitations of x-ray to the physical laws in roentgenology, making a plea for repeated examinations to avoid errors due to idiosyncrasy, claiming that haste is an American characteristic often unnecessary and often causing avoidable errors, asking that details of radiological treatment be left to the

radiologist in order that this effective weapon against disease may produce its greatest good

CHAIRMAN COOK Are there any questions for Dr Van Allen? I had hoped this would bring forth considerable discussion from the floor. If there are no questions we will proceed to the second paper which is "Vascular Nevi and Their Treatment" by Dr J Harper Blaisdell, of Boston.

## VASCULAR NEVI AND THEIR TREATMENT\*

BY J HARPER BLAISDELL, M D †

THE baby is indeed fortunate whose parent can be assured at the end of its first six weeks of life that it is free from any of the many kinds of birthmarks to which the human race is prone. In the volume of Dermatology and Syphilology in the Practitioner's Library of Medicine and Surgery published by Appleton a month ago, Traub classifies nevi into forty-one different types, which may be grouped into six main divisions, vascular, pigmentary, verrucous, hairy, glandular and systematized. Most of these abnormalities of the skin are either present at birth or develop shortly afterwards. This paper discusses from the viewpoint of practical treatment the handling of the vascular division of nevi.

As the name implies these nevi are caused by an abnormal overgrowth of the blood vessels which vary in size from a tiny pin-point capillary loop to the tremendous cavernous lesions involving both venous and arterial systems and covering many square inches of the cutaneous and mucous surfaces.

The simplest nevus is the so-called telangiectasia nuchae or flat vascular nevus, sometimes called nevus simplex. This usually appears as a very faint staining of the skin of the forehead or the nape of the neck. The capillary overgrowth may be so slight that the pinkness of the skin becomes apparent only when the child cries. It is estimated that one third of all new born babies show this lesion in some degree, but in the majority of cases it disappears completely in the first few weeks of life. In those cases in which it persists into adult life it is so inconspicuous that its possessors are usually unaware of its presence. Obviously in this type, treatment of any sort is uncalled for and if any form of therapy were used the end-result would be more conspicuous than the original birthmark.

The nevus araneus or spider nevus is a lesion the size of a pin-point or pin-head, and is caused by the overgrowth of a capillary loop. It is often accompanied by an encircling areola

of tiny blood vessels from which the name spider nevus arises. This type of lesion appears at any time from infancy to adult life. When it occurs during the first few weeks it is probably a true congenital defect and is the type of lesion from which the larger, elevated nevi develop. It is my opinion that when this type of lesion does not occur until puberty or adult life it is not a nevus at all, but a simple blood-vessel tumor caused by trivial localized trauma, such as shaving picking at an acne lesion or mosquito bites.

The treatment of this lesion, no matter at what age it occurs is simple and effective. The central blood vessel is pierced by a needle and the capillary loop destroyed by electrolysis or by the electrocoagulation of a monopolar current. In actual practice it is easier to spray the central vessel with the small brush-like spark of the monopolar current before the loop is punctured by the point of the needle. With this technique a persistent and embarrassing oozing from the blood vessel can be avoided and the time of electrocoagulation much shortened.

The nevus flammeus or port-wine mark is familiar to us all. It appears at birth or shortly afterwards on the face or more rarely on other parts of the body. In size it varies from a tiny lesion to a mark covering half the surface of the face for instance. Its color ranges from a light red to a deep reddish purple. The surface of the skin is smooth and nonelevated. This lesion will persist throughout life and practically never disappears spontaneously.

Generally speaking, treatment of a port-wine mark gives a result which is unsatisfactory both to the patient and the physician. This is because it is impossible to destroy the capillary overgrowth without producing a scar which is more conspicuous than the original birthmark. As a practical matter the application to the smooth uniformly colored surface of this lesion of radium carbon dioxide snow or the Kromayer water cooled lamp cannot be done without occasional overlapping of the treated areas. This irregularity of dosage produces a checkerboard like scarring vastly more conspicuous than the original mark. In the darker colored lesions the capillary plexus

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is so deeply seated that if electrocoagulation is used vigorously enough to destroy it, the end-result is as unsightly as when radium or carbon dioxide snow is used.

During the past few years some improvement of these lesions has been noted by a few dermatologists who have employed the air cooled mercury quartz lamp. The normal skin surrounding the nevus is carefully screened and the ultraviolet light applied in sufficient dosage to produce marked erythema and vesiculation. The resulting dermatitis is treated in the same way that any sunburn is handled and succeeding treatments take place at intervals of three or four weeks. Four or more treatments are necessary to secure the maximum of improvement. If the majority of the capillary loops are sufficiently close to the surface of the skin, this wholesale but safe canterization produces enough destruction to insure considerable lightening of the area without resulting in atrophic scarring of the skin.

The nevus vasculosus, with its numerous aliases of angioma, hemangioma, nevus sanguineus, strawberry mark and raspberry mark, is the commonest type with which we have to deal. It occurs frequently on the face, but may appear on any part of the body. In size it varies from a lesion the size of a pin head to one covering many square inches of surface. The same individual may present several lesions of varying size on different parts of the body and oftentimes a single large lesion is surrounded by a spattering of smaller ones. The object of treatment is to transform a conspicuous elevated reddish purple mark into a comparatively inconspicuous flesh colored flat scar. In the more superficial lesions the resulting skin surface will be practically normal in appearance, but this happy result cannot be expected nor should it be promised in the case of the large dark lesions. Electrocoagulation by the monopolar current produces excellent results with a minimum of scarring in either the single small lesions or the satellite variety.

In the early days of this century the method of choice was destruction by liquid air, but carbon dioxide snow soon supplanted it because of the advantages of cheapness, accuracy of application and the ease of the variation of dosage. Carbon dioxide snow in turn has been supplanted by radium which today is probably more commonly used than any other agency.

Carbon dioxide snow removes the nevus by a nonselective mass destruction of the surface skin and the underlying plexus of blood vessels. The frozen area sloughs out and the destroyed tissue is replaced by a scar. The more elevated lesions may require several applications of the snow to reduce them to the plane of the normal skin, but once this level is approached, extreme care must be used to pro-

duce a minimum of slough in order that the final scar may not become depressed and because of this become more conspicuous. A better cosmetic result is obtained by having, as the end-result, a slightly reddened scar, level with the skin, than a completely white scar considerably depressed below its surface. All of this requires a skill of application and a sense of timing of dosage which only experience can teach. It is essential that the snow cravon should be shaped to the size of small lesions and under no conditions should its edges project over the margin of the nevus on to the normal skin. An overlapping of the treated area produces irregular destruction of the nevus with a resulting unsightly mottling of the scar. The sloughing of the tissue is in direct proportion to the pressure and the length of time used. It is well to develop a sense of uniform pressure during the application and govern the dose by the time element. The average time of application is thirty seconds, fifteen seconds giving a light reaction and sixty seconds being the limit of safety to be used only on a thick, elevated birthmark.

Radium has been a popular method of treatment for many years and in skilled hands is capable of giving excellent results. Its use is based upon the principle that the endothelial cells lining the blood vessels are sensitive to radiation. This sensitivity is in proportion to the age of the child so that the amount of radiation necessary to obliterate a nevus in a year old baby would have to be greatly increased to obtain the same result in a child of 6 or 8 years. It is truly impossible to lay down dogmatic rules for the application of radium. Every case must be individualized depending upon the location of the nevus, the size of the lesion with reference to its elevation and its depth and the amount of radium and the type of applicator available. There are, however, certain principles upon which all dermatologists are agreed. In using radium plaques the edges of the applicators should not extend over on to the normal skin and in treating a surface larger than the area of the applicator, care must be taken that the edges of the treated areas do not overlap. It is a generally accepted principle today that a suberythema dose should always be given. Obviously, the deeper the lesion the greater is the amount of radiation necessary to cause resolution and as the amount of radiation increases so must the amount of screening increase in order to provide the necessary protection. For example in a thin nevus, 2 mm in depth, a half strength applicator with a screening of 0.6 mm of aluminum may be used for thirty minutes. Unless the lesion is growing rapidly no treatment is necessary for a month, and the third and fourth treatments may follow at intervals of two months. As the

lesions increase in depth, the amount of screening is increased and the time of treatment lengthened so that the soft beta rays are completely screened off and only a mixture of hard beta and gamma rays is penetrating to the base of the birthmark. In the deepest types it is advantageous to use radium in tubes to the amount of 25 to 100 milligrams. Under these conditions the radium is screened by silver and brass and the tubes are elevated above the surface of the skin from 1 to 2 centimeters. Depending upon the amount of screening and the distance from the surface of the skin, the time of application may extend for several hours. As in the case of using plaque applicators, care must be taken that the treated areas do not overlap.

The cavernous angioma is simply an enlarged form of the nevus vasculosus. In this type the nevus is composed of greatly enlarged blood vessels which extend deeply into the subcutaneous tissues. Arteries, veins and capillaries make up the blue or black mass which may be of tremendous size and horribly disfiguring. Carbon dioxide snow does not give particularly good results. The depth of the blood vessel enlargement is so great that the mechanical removal by sloughing ends in a scar that is far from pleasing from a cosmetic viewpoint. In this field radium is of the greatest help and the sooner it is applied the better. As the child grows older the endothelial lining of the blood vessels becomes progressively less radium-sensitive and the original angiomatous mass becomes more and more partitioned off by fibrous connective tissue. Gamma radiation from a 50 or a 100 milligram tube of radium is used. Screened by brass and silver and a distance from the surface of the skin of one centimeter, each one inch square area may receive safely a dose of 100 to 200 milligram hours. Under such conditions no erythema of the skin will result and the second treatment can be given after an interval of two months. Subsequent treatments should take place at intervals of three to six months.

Surgical removal has a definite place in the treatment of nevi and one that is too little considered by either the dermatologist or the surgeon. The risk of uncontrollable hemorrhage from operative procedure is small, but its possibility acts as a distinct deterrent to skilled and courageous surgeons. It is a prompt and satisfactory method of removing isolated lesions on the body. A linear scar on the legs, arms or body of a boy, for instance, will be quite as satisfactory to all concerned as the more lengthy and more expensive removal by radium.

In theory, radium appears to be an ideally specific treatment. In actual practice, however, it is quite a different matter. The anxious parents demanding action and quick results, the

squirming crying baby, the difficulties of firm, even application to the irregular contours about the eyes, ears, nose and lips, the trouble of adapting the rigid, square outlines of the applicators to the irregularly rounded edges of the lesions, the necessity of guarding against overlapping of the treated areas, the ease of mistaken judgment in screening, resulting in unsightly and potentially dangerous scars with atrophy and telangiectasia and possible malignant changes in the years to come, all combine to make the pathway of birthmark removal by radium far from an easy one. It is pertinent to record that the Children's Hospital of Boston has never swerved from the use of carbon dioxide snow throughout these years of radium popularity and it is still the opinion of the surgical staff that the results are equal to, if not generally better, than those obtained by any other method. After many years of experience with radium, my own opinion is that radium should be restricted to selected cases and that carbon dioxide snow is the safer and more satisfactory remedy for general use.

Spontaneous resolution frequently occurs in the nevi of the elevated type. When this is accompanied by ulceration, as often happens in the deeply seated cavernous type, the resulting scar is fully as disfiguring, if not more so, than that produced by skillful treatment. The resolution of such a lesion is rarely complete, and tag ends of nevus tissue frequently remain at the outer edges of the original lesion. It is possible for the smaller and less elevated nevi to disappear, leaving an unblemished skin. Some go so far as to state that practically all of the elevated types of nevi will disappear during the early years of childhood, and, for that reason, recommend that no treatment be given unless the particular lesion is increasing in size during infancy. This phenomenon is entirely contrary to my own experience and, during almost any walk along our streets, birthmarks will be seen whose unsightly appearance has been endured for many years.

All authorities agree that in many cases, if not a majority, vascular nevi are not present at birth but make their appearance in the first few weeks of life. Repeatedly, mothers have told me that the lesions, which at the time of coming for treatment have grown to a half inch or even to several inches in diameter, were first noticed in the early weeks as one or more red spots the size of a pinhead. Treated during this period the tiny capillary overgrowths would have yielded promptly and with perfect cosmetic result to one or two applications of the monopolar current and would have prevented absolutely the development of the unsightly nevus, which was to grow in the coming months. In many cases the mothers ascribe the lack of appreciation for the necessity of early treatment

to the fact that they were assured by either the doctor or the nurse that these tiny lesions would disappear of their own accord. Routine inspection of all babies three weeks old by the general practitioner, obstetrician or pediatrician, who is appreciative that these are the red danger signals of future nevi, and their prompt and appropriate treatment, would prevent a great deal of the heartache, disfiguration and costly treatment which neglect of these all too common birthmarks entails.

## DISCUSSION

CHAIRMAN COOK. The discussion of this paper will be opened by Dr E. Lawrence Oliver of Boston.

DR E. LAWRENCE OLIVER. *Mr Chairman and fellow members*—I thoroughly agree with Dr Blaisdell in almost everything that he said. Dr Blaisdell spoke of the nevi on the neck of the new born babies, which occur in one third of the infants as disappearing with the growth of the child. I feel a great many of these persist but because they are covered by hair are not noticeable. If you examined everybody's head for these I think you would find a considerable number of them that remain. I have one on the back of my neck and quite a number of students I have noticed have them also. They are not important and are perfectly harmless and treatment is practically never necessary.

I think the treatment of port wine marks is fairly satisfactory with ultraviolet light. I don't mean that we can cure them entirely. It is very rarely that one can get 100 per cent or near 100 per cent improvement but I think a 50 per cent improvement is very often obtained with ultraviolet light. I can only remember one case where I did get practically 100 per cent result and that was a port wine nevus on the neck of a young woman of twenty-five. To avoid the checkerboard appearance Dr Blaisdell mentioned I use the water cooled lamp a short distance from the skin protecting the normal skin with paper. I use very large doses and give perhaps ten minutes exposure a half inch from the skin. Unless the treated area becomes infected, which it very rarely does I think there is not the slightest danger of scarring.

I think I am one of the persons that Dr Blaisdell referred to as claiming that many of the larger nevi of the cavernous type disappear spontaneously. I have followed many that had no treatment whatsoever and although it took a long time many of them disappeared without a trace. It is my strong belief that this type of nevus is almost never seen in adults. I think Dr Blaisdell was not referring to this type which is made up of cavernous vessels is dome shaped and is easily compressible. I don't

mean we should never treat this type of nevus as cure may be hastened by treatment, but I think we should bear in mind that spontaneous disappearance is not only possible but probable and, therefore we should avoid doing anything that might produce a scar.

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DR. BLAISDELL. Perhaps getting away from the subject and speaking of keloids it is my opinion that surgical interference should never be done because keloids will return in still larger form. I have seen that happen repeatedly. Another point of interest in connection with keloids is that a patient who will develop keloids on one area of the body will not necessarily develop the keloid on other parts. Nevertheless it gives you a little shiver to treat lesions by incision when the patient does show keloids in other localities.

Dr Claudio Pavzant of Boston then read a paper entitled 'The Value of Physical Therapy in Certain Physical Conditions.'

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(Section adjourned.)

## ARACHNIDISM\*

BY A S HARGIS, M D †

CASES of poisoning from the bite of the "black widow" spider, *Latrodectus mactans* are of much more common occurrence than is generally believed. This has been brought to our attention in recent years chiefly through papers on this subject by Bogen,<sup>1</sup> Walsh,<sup>2</sup> Blair<sup>3</sup> and others. Only lately has it been possible to impress on the majority of physicians and the more skeptical general public that the bite of so small an insect could produce such severe and so wide a variety of symptoms. The medical world has only of late become "spider conscious," and even more recently through the dramatic accounts published in the newspapers and various journals has the general public become acquainted with this small but dangerous insect. The black widow spider being so called because she devours the male, has a number of names throughout the country. The more common of these are the "hourglass" spider, the "shoebutton" spider, the "T bar" spider, the "po-ko-moo" spider and the "poison" spider.

## HISTORY

From time immemorial, varied and fanciful tales of poisonous spiders and the horrible effects of their bites have been spread by the highly imaginative but unscientific laity. The loathsome and hideous appearance of the insect lends itself greatly to this point of view. Another misconception of the laity is that the larger the spider the more dangerous its bite. The bulk of data on the subject of spider bite has been contributed within the past fifteen years. However, literature is available as far back as 1720, more than 200 years ago.

LIFE HISTORY OF *Latrodectus mactans*

Details regarding the life history of *Latrodectus mactans*, its appearance, habitat, web, feeding habits, and so forth have been borrowed freely from Blair's article on this subject.

**Appearance.** The mature female is a coal-black glossy insect the body being about one-half inch in length and the slender legs covering a span of from one and one-half to two inches. The abdomen is globose, and on the ventral aspect of the abdomen there is a bright red spot, usually in the shape of an hourglass. The legs on closer inspection, are covered with fine black hairs. There may be a smaller red spot on the abdomen somewhat nearer the head. The mature male is generally about one-half to two-thirds as large as the female. In addition

to the red, ventral, abdominal markings, common to both sexes, the male has a row of orange spots down the midline of the dorsal surface of the abdomen, three orange-yellow stripes on the side of the abdomen and straw-colored bands on its legs. For a more complete detail one should consult Blair's excellent article.

**Habitat.** The black widow spider is found in varying degrees of plentifulness throughout the temperate and tropical zones of almost the entire world. In these United States they are far more common in the southern half, but have been found from New Hampshire to Florida and from North Carolina to California. The favorite haunts of these spiders are in dark and preferably dry places such as outhouses, buildings around old stumps, holes in the ground, old lumber, trash heaps, between roots of trees and beneath rocks. They are more frequently found around human habitations.

**Web.** The spider's web is quite characteristic and once observed closely is easy to identify again. This, incidentally is a valuable aid in the eradication of this dangerous pest. The web is composed of irregularly arranged coarse threads which crisscross at various angles and many different planes. It is usually built within or near a corner or crevice and is rather cone-shaped. The web despite its irregular construction is quite strong and will serve to capture and hold insects many times the size of the spider. The web of the male is much weaker than that of the female.

**Feeding Habits.** When an insect becomes entangled in the web, the spider rushes out and soon further entangles its victim with strands of a sticky silk. The spider then approaches its prey, inserts its claws and the venom is thereupon injected. After a few minutes the struggles of its victim cease, it further enmeshes its prey, raises it to a more suitable place on the web, fastens its mouth on the victim and leisurely proceeds to suck the body fluids. These spiders do not require frequent feedings, often going as long as a month without any appreciable ill-effects.

**Mating.** The actual process of impregnation has not been observed but is generally believed to occur in the fall or early spring. Reasons given for this are that the mature males are found to be most plentiful in the fall and that many females captured in the fall and kept alone during the winter lay fertile eggs the following spring.

**Egg Sac.** The eggs are deposited in a globular sac of silk which is usually greyish-white to a light cream color and darkens to a light tan with age. The laying of the eggs and the forma-

\*From the Medical Section of the Employees Hospital, Tennessee Coal Iron and Railroad Company, Fairfield, Alabama.

†Hargis, A. S.—Resident in Medicine, Tennessee Coal Iron and Railroad Hospital, 1935-'36. For record and address of author see "This Week's Issue," page 59.

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by *Latrodectus mactans* at which time the insect injects the toxin into the body of its victim. There has been some discussion as to just how the toxin acts in the body and where it has its effect. As stated by Gilbert and Stewart<sup>10</sup> the active principle of the venom has not as yet been isolated but the consensus seems to be that the toxin directly stimulates the neuromuscular junction or acts on the nerve endings.

There is no lasting immunity to the bite of *Latrodectus mactans*. Recent work on this subject has shown that serum from a person recently bitten is of questionable value in alleviating symptoms in a patient just bitten. Past experience with this type of therapy has been disappointing and we await the more recent work of Do Amaral with interest. His excellent results in the field of antivenoms for snake bites excite us to greater expectancy in his latest undertaking.

#### SYMPTOMS

The symptoms in a well-marked case of arachnidism are startling and dramatic. Seldom will we encounter a clinical entity which impresses us more than this condition. More often than not when first seen by the physician the patient has been bitten several hours and is in intense agony. He may be rolling and tossing about the bed unable to keep still. He may cry out at times when the pain seems intensified. A number of our patients have been disoriented and only became aware of their surroundings several hours after admission to the hospital. Obviously a history was out of the question in these cases. The intense pain has been described by various patients as sharp lancinating cramping aching or constricting in character. Many have stated that the pain seems to come and go varying in intensity leaving them with short periods of comparative comfort. The pain seems to spread slowly from the site of the bite, keeping pace with the dissemination of the toxin by means of the lymphatic drainage until it is emptied into the general circulation at which time it seems to spread with much greater rapidity to all the great muscle groups of the body. Many patients bitten will describe the bite as a sharp, stinging sensation somewhat similar to but more severe than that administered by the large red ant. The pain in the area of the bite soon disappears thus probably being due to some extent to the overshadowing influence of the greater pain produced by the disseminated toxin elsewhere in the body.

The muscle groups most frequently involved are those of the shoulders back abdomen and thighs. However one must not be entirely dependent upon this as we have seen patients with only the abdominal muscles involved upon

first arriving at the hospital. Later other muscle groups were included. Again we must be careful because the varying number and intensity of symptoms in a case of arachnidism may be influenced by the amount of toxin injected, the personal degree of reaction and the patient's physical condition. In most cases we have observed that the blood pressure has been elevated but one must remember that some may have been high before the time of the bite and in others a low blood pressure may be caused by shock which is present at some time in the majority of cases.

The personal experience following the bite of *Latrodectus mactans* as described by Blair, is by far the most excellent and exhaustive I have yet encountered. For a more detailed description of the symptoms one should refer to his paper to which I have repeatedly turned and from which I have quoted freely.

Many symptoms other than the ones previously mentioned may be present. Some of these are the following: profuse cold perspiration, subnormal temperature, difficult breathing, restlessness, anxiety, nausea, vomiting, anorexia, cyanosis, delirium, prostration and shock, vertigo, acute urinary retention, rapid pulse and many others in the category of acute medical or surgical emergencies.

#### LABORATORY FINDINGS

**Urine.** Other than a tendency to retention in a few cases no abnormal urinary findings were present that could not be attributed to some previously existing condition.

**Blood.** A moderate degree of polymorphonuclear leukocytosis was present in 51 per cent of our cases. However some of these cases did not have a blood count made until several hours after admission to the hospital. Other blood findings were normal.

**Spinal fluid.** As stated by Gilbert and Stewart<sup>10</sup> the spinal fluid pressure is known to be elevated but no pathologic findings attributable to spider bite have been found.

#### DIAGNOSIS

Correct diagnosis is of the utmost importance. Some of the more characteristic points are enumerated below.

**History.** A history of the bite is extremely important in making a diagnosis of arachnidism. Most frequently the bite is on the genitalia and has been experienced in a privy. A number of the patients have actually seen the spider and several have brought the spider with them when they came to the hospital.

**Distribution and Character of Pain.** The pain usually, but not always, spreads slowly from the site of the bite following the lymphatic drainage until it empties into the general circulation, at which time the spread of the



tion of the sac seem to take place at night, as the actual process has not been observed. If well fed, the female spider is capable of laying more than one sac of eggs. The number of eggs varies widely, ranging from less than one hundred to more than six hundred.

**Eggs** The eggs are translucent and about one millimeter in diameter. The color varies from a creamy white to a pale mauve. They have a rather hard covering which protects the semifluid contents. They will bounce in a lively manner when dropped and apparently suffer no injury. These tiny eggs are very poisonous. A few drops of a saline emulsion of crushed eggs injected intravenously into a rabbit will kill it within two minutes. This has been demonstrated by Blair.

**Development** During the hot summer months about ten to eleven days are usually required for hatching. The small spiders stay in the egg sac until after the first moult which occurs generally in about five days. They become more and more active after the first moult and finally make a small hole in the sac and emerge one by one, spinning a web as they go. If the weather is warm, this usually occurs about twenty-five days after the eggs are laid. After they emerge, the small spiders cluster in their webs and in a few days moult again. By this time their food supply furnished by the egg has been exhausted and they must forage for themselves. Unless more accessible food is available they begin to feed on one another as the mother makes no effort to provide for them and may feed on them herself. Six moults are required before reaching maturity, the average time being about fifteen days between each but as long as one month may elapse.

**Life Span** The average life span of the female is about one year. The life span of the male is generally less than one year, due usually to the cannibalistic habits of its mate and to its more delicate and less hardy physical structure.

#### INCIDENCE

In 1926 one hundred and fifty cases of spider bite were on record in the medical literature. Some of these dated as far back as 200 years, but the bulk of them were recorded in the previous decade. The amount of skepticism evinced toward such a definite clinical entity is remarkable, as noted by Bogen at the time of his review. This skepticism is still evident among quite a few practitioners and a larger percentage of the laity, in spite of the numerous and exhaustive works on this subject in the nine years following 1926. Some observers have commented that spider bite is becoming more and more frequent and offer, in support of their statements, the increasing number of cases and the apparent increase in the number of

the increasing number of cases are explained by a more thorough knowledge of the condition and by the fact that physicians now are more alert for cases. Also physicians and laymen are better able to recognize the spider because of the many accurate descriptions of the insect in the literature.

**Season** Forty-three cases of arachnidism have occurred in this institution from 1924 through 1935. There seems to be a definite seasonal incidence in cases of spider bite. The greater number of cases occurred in the latter part of the summer and the first part of the fall months, corresponding closely to the season when the spiders are most numerous. We have had cases of arachnidism in every month of the year but the greater number of cases occurred in August and October. The following table gives the seasonal occurrence in our series of cases.

SEASONAL INCIDENCE OF SPIDER BITES

No. Cases		No. Cases	
January	1	July	5
February	1	August	8
March	1	September	4
April	3	October	9
May	4	November	4
June	2	December	1
Total		43	

**Age and Sex** *Latrodectus mactans* is no respecter of age, sex or color, although by far the majority of our cases were adult males, the ratio being thirty-four males to nine females. Although there is essentially no particular location of choice for the bite, the greater percentage of bites in our series occurred on the genitalia, the genital bites being thirty-one and the extragenital bites being twelve. The most plausible explanation for both the preponderance of cases being males and the site of the bite being on the genitalia is that the spider inhabits the outhouse rather frequently and that the male genitalia are pendulous. Spider bites occur most frequently in adults for the same reason.

**Geographic Distribution** It has been declared that there is probably a geographic variation in the toxicity of the bites. Perhaps this is true, as by far the greater number of deaths directly or indirectly attributable to spider bite have originated in California. It is easily conceivable that spider bite, superimposed on some already existing severe pathologic condition, may materially aid in producing death. However, sufficient autopsies and definite clinical data have not yet been collected to establish this as a fact.

#### ETIOLOGY

Once a definite history has been established, the patient is bitten

## OLIVER WENDELL HOLMES ANATOMIST, AUTOCRAT, POET\*

BY ROBERT M. GREEN, M.D.†

ONE hundred years ago, in the spring of 1836, Harvard had the perspicacity to bestow her Doctorate in Medicine on a promising young man, destined to be one of her most eminent alumni, the only distinguished member of an otherwise undistinguished medical class. This young man was Oliver Wendell Holmes, son of Abiel Holmes, minister of the gospel. Abiel Holmes—*absit omen*—was a graduate of Yale, not the first or the last good man who has come to us from our sister university.

Born at Cambridge, Massachusetts on August 29, 1809, Oliver graduated from Harvard College with the notable class of 1829, whose members he commemorated in a poem on every anniversary from 1852 to 1889. This little known group of class poems, of which perhaps the most celebrated is "The Iron Gate," constitutes a most touching and intimate revelation of Holmes's personal relations with his classmates. Among these was Benjamin Peirce, mathematician and astronomer, whose mind soared to such abstruse heights of pure reason that Emerson applied to him Wordsworth's verse of the skylark, "A privacy of glorious light is thine." Among them also was the modest and retiring future author of "America" of whom Holmes wrote "Fate tried to conceal him by naming him Smith."

With these and similar comrades Holmes passed his undergraduate days, and, after three years spent in teaching and travel and study of the law, entered Harvard Medical School where he became a pupil of Jackson Ware, Channing, Jacob Bigelow and the junior Warren, second of that distinguished dynasty. Always intellectual, brilliant and versatile, Holmes showed himself eager and ambitious in medicine. In the year of his graduation, he won the Bowdoin Medical Prize for an essay on "Intermittent Fever," and then broke all precedents by winning the prize again in the next two years, after which it was voted that no one should be allowed to win the prize more than twice.

In the Boston Medical Library is a bound copy of these three essays autographed on the title page in Dr. Holmes's precise, old-fashioned hand for presentation to his friend, Dr. Chadwick. In the essay on "Intermittent Fever" there was evidently some confusion, as was natural in the light of existing knowledge, or rather in the darkness of existing ignorance, between malaria, tuberculosis and typhoid, but

with this allowance, the work shows amazing perspicacity, vigor of thought and keen grasp of clinical details. In the *Boston Medical and Surgical Journal* of January 31, 1838, I find the following editorial comment upon the volume in question: "From the exhibitions of talent which Dr. Holmes has given in these essays, his future course will be watched with interest. The volume now embodying the three papers cannot well be dispensed with, because he has become a native author. It is this latter character which gives peculiar value to his writings. The decision of the committee in awarding the prizes to Dr. Holmes gives an official assent to the excellence of each product, which after years will confirm and strengthen."

Immediately upon graduation Holmes plunged wholeheartedly into the practice and teaching of his profession. He was an early and abundant contributor to medical literature and his essays, both on account of their scientific value and their charm of style, adorn the pages of the early volumes of the *Boston Medical and Surgical Journal*. Among his medical essays dating from this and later periods there is an admirable one, "Of the Physiology of Walking," which might be recommended to students of orthopedics today. The essay on "The Human Body and its Management" is a brief compendium of physiology and hygiene whose basic data are still accurate and commendable. Most famous of Holmes's medical essays is that on the "Contagiousness of Puerperal Fever," which served in large measure to introduce into this community an accurate knowledge of the true nature of obstetric sepsis some time before the work of Pasteur and Lister.

Though a practitioner of general medicine, Dr. Holmes had a lifelong interest in the study and teaching of anatomy. From the time of his graduation he served as a prosector and assistant under Dr. Warren in the Anatomical Department of the Harvard Medical School and upon the latter's retirement was appointed the first Parkman Professor of Anatomy and Physiology in 1847. His initial lecture to his class in this capacity evidently attracted considerable attention at the time for, in the *Boston Medical and Surgical Journal* of December 3, 1847, there is the following editorial comment: "The high expectations in regard to the new Professor of Anatomy in the Harvard University have not been disappointed. The daily press of the city has anticipated us in commenting upon his introductory lecture. Little remains for us but to repeat the language of others. Of this pleasure, however, other editors shall not deprive us, namely, of saying that it

Delivered before the Harvard Medical Colloquium, February 6, 1936.

\*Green, Robert M.—Surgeon in Chief for Gynecology and Obstetrics, Boston City Hospital. For record and address of author see "This Week's Issue," page 50.

pain is much more rapid. The full array of symptoms is generally reached within an hour after the bite. The large muscle groups, as the arms, shoulders, back, abdomen, thighs and legs are involved.

**Rigidity.** There is a marked board-like rigidity of the abdomen, and the intercostal muscles may be so constricted as to interfere with respiration. The contractions of the back muscles may cause stiffness and backache. A marked spasticity of the extremities is noticeable and reflexes are generally hyperactive. The throat muscles may be so constricted as to interfere with, or completely stop, speech or swallowing. The degree of spasticity of the muscles involved seems to vary from time to time, with slight periods of comparative relief.

**Tenderness.** Marked localized tenderness was at no time observed in any of our patients. Some was present to a slight degree in a few, but compared with the intense pain and rigidity was relatively mild. Thus, incidentally, is one of the most important aids in a differential diagnosis.

**Temperature.** The temperature was normal in the greater percentage of our cases.

**Perspiration, Restlessness and Anxiety.** Profuse perspiration, inability to keep still and anxiety are fairly constant symptoms.

One may be momentarily confused in making a correct diagnosis of spider bite. Some general conditions which must be ruled out are a ruptured or perforated viscus, appendicitis with perforation, tabetic crisis, acute pancreatitis, nephrolithiasis, cholelithiasis and food poisoning. Pleurisy and pneumonia must also be considered. However, a thorough knowledge of these conditions with their individual characteristics plus the usual help of a history will serve to make a correct diagnosis in almost every case.

#### PROGNOSIS

Compared with the severity of the symptoms, the mortality from spider bite is relatively low. There have been approximately seventeen deaths in more than four hundred cases. However, no autopsies were done and all these may not have been due to a spider bite. The mortality from arachnidism has been given as 2 to 3 per cent.

#### TREATMENT

The treatment of spider bite has varied widely in the results obtained. A number of different types of therapy have been tried, and the reports have been good, fair and indifferent. So far as we have been able to determine no one has tried a combination of the most promising remedies. We have devised a standard routine of treatment for spider bite cases entering this

hospital, which we believe produces for them a quicker, greater and more lasting degree of comfort. Our method of treatment is as follows:

- 1 Morphine sulphate, gr  $\frac{1}{4}$ , hypodermically. Repeat frequently, if necessary.
- 2 Calcium gluconate, 10 cc of a 10 per cent solution, intramuscularly. Repeat frequently, if necessary.
- 3 Glucose, 50 cc of a 50 per cent solution, intravenously. Repeat, if necessary.
- 4 Hot tub immersion for one hour or more. Repeat, if necessary.
- 5 Put to bed, cover well and keep warm, preferably with a radiant light.
- 6 Force fluids and avoid constipation and urinary retention.

#### SUMMARY

- 1 More and more cases of arachnidism are being reported yearly. It is a definite clinical entity—not to be lightly taken.
- 2 Experienced physicians, unless keeping always on the alert for this condition, may confuse the symptoms with those produced by an acute intra-abdominal lesion.
- 3 Forty-three cases of arachnidism have been admitted to this hospital in the past fifteen years. There have been no fatalities.
- 4 History of the spider bite and marked generalized muscular rigidity, with little or no tenderness, are the most poignant factors in making a correct diagnosis.
- 5 Spider bite cases occur most frequently in the latter part of the summer and the early part of fall, in keeping with the period at which the insect seems to be most plentiful.
- 6 A combination of the different methods of treatment advised by the various authors on this subject has been found to be more beneficial than any one of these procedures.

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me among my grandfather's papers A foot note states that "These verses were read at a medical supper party about the year 1845' There is no indication before which one of the famous medical clubs of Boston this poem may have been delivered Evidently it was a convivial occasion and the verses present not only their author but his audience, as "Lieber Mahlzel" said of the great Beethoven, in an "unbuttoned mood" Remembering that at this time Holmes had not yet received his appointment as professor, there seems in this poem a certain daring which, however, is quite characteristic of his intellectual ability and independence May I conclude by reading a few selected passages from these authentic but I think, hitherto unknown verses of Dr Holmes'

"This evening hour, which grateful memory spares  
From evening toil and unrequited cares  
These curling lips these joy revealing eyes  
These mirthful tones re-echoing as they rise,  
These friendly pledges on this festive shrine  
The glistening goblet and the flowing wine  
This genial influence which the coldest heart  
Warms to receive and opens to impart —  
Mock the poor Art who does her subjects wrong  
And steals from Pleasure all she wastes in song  
Yet since you ask this feeble hand to strew  
Wreaths on the flowers and diamonds on the snow  
Take all it bears and if the gift offend  
Condemn the Poet,—spare' oh spare' the friend'

'Yes while I speak some magic wand appears  
Shapes the long past (Oh say not happier) years  
Ye lawless fancies yet untaught to know  
The charms of reason or the scourge of woe  
Ye boyish dreams now melting into air  
Ye virgin forms alas no longer fair  
Ye scattered friends with many a tear resigned  
Once all our own now mingled with mankind  
Since save in memory we appear no more  
In the bright Present let the Past live o'er  
Still in the heart some lingering spark remains—  
You cannot chase it from the shrinking veins  
Grief comes too early Pleasure near too late  
Snatch the fair blossom whatsoever its date  
If youth still charm thee mirth is justly thine  
If age has chilled thee—lo! the generous wine'

Oh thoughtless revellers when you set my task  
How little dreamed you of the toil you asked—  
How shall I please you? I a grave young man  
Whose fate is drudgery on the useful plan  
How can I coax you smooth you comb you down  
And cheat your frontals of that awful frown?  
Portentous scowl' which marks in every age  
The blistering clystering tooth-extracting sage  
A verse too polished will not stick at all  
The worst back scratcher is a billiard ball  
A rhyme too rugged would not hit the point  
Its loose legs wriggling in and out of joint  
Shall I be serious touching lachrymose  
Mix tears with wine and give you all a dose?  
But well filled stomachs have not room for grief,  
For sips and sighs—for porter and roast beef  
Shall I be learned and with punch and claw  
Dig stumps of Greek from every Ancient's jaw?  
But who quotes Cuvier when he feasts on snipe,  
Or reads Gastritis when his wife cooks tripe?  
Not all the wisdom of recorded time  
Can change one tidbit to concocted chyme

Not all the schools from Berkshire to the Nile  
Can melt one sausage into milkv chvie  
Nor all the Galens since Deucalions' flood  
Change lifeless pudding into living blood

\* \* \* \* \*

Our noble Art which countless sharks invade  
Some as a science many as a trade'  
In every column quackery has its line  
From every corner stares the doctor's sign  
From every shore the straining vessel tugs  
Ill-scented balsams stomach turning drugs  
The keels of commerce clear the farthest surge  
Lest some old beidam want her morning purge  
The seaman wanders on his venturesome route  
To turn a baby's stomach inside out.  
Rich were the Queen of yon hepatic isle  
With half her subjects squander on their bile  
Rich were Van Buren could he pay his bills  
With half his peoples waste on Brandreth's  
Pills —

Or with their products fill his farmers carts  
With tare and tred for reproductive parts

If one great truth defies the sceptics scorn  
That truth is this—that children must be born  
If one great maxim man dare not deny,  
That maxim is—that mortal man must die  
If long experience be not all a trick  
Who dares to say that mortals can't be sick?  
These solemn truths by thinking minds allowed  
Lift the stern reasoner from the vulgar crowd  
From every truth some vast conclusion flows  
Truth is the pump and reason is its nose  
It's handle logic work it and it brings  
Transcendent streams from transcendental springs

Heaven surely ordered on Creation's morn  
This mighty law—that children must be born  
Hence came the science thou dost show so well  
With white forefinger Madame Lachapelle!  
Hence came the forceps hence the screw to pinch  
The soul's own viscus down to half an inch.

\* \* \* \* \*

Thus with the entrance of the first born man  
The reign of Science o'er the earth began  
Nurse of his weakness soother of his woes  
She waits and watches till his sorrows close  
Nor yet she leaves him when the undying mind  
Flits from his clay and leaves the frame behind

If thou shouldst wonder that mankind must die  
Ask the Creator of our Museum Why?  
Were man immortal who had ever seen  
The stomach colon kidneys pancreas spleen?  
Each pickled viscus every varnished bone  
Seducing scirrhus and attractive stone  
Lost to the world had never come to grace  
Our well filled phials in their padlocked case

Unknown to fame had Morgagni sighed  
And Louis floated down oblivions tide  
On Brannens glands no cheering ray had shone  
And Pever claimed no patches save his own  
Science untaught her scalpel to employ  
Had seen no ileum since the days of Trov  
And man the ruler of the storms and tides  
Had groped in ignorance of his own insides  
Thus the same art that caught our earliest breath  
Lives with our life and lasts beyond our death  
Man ever curious still would seek to save  
Some wreck of knowledge from the waiting grave  
Yet keen-eyed searcher into Nature's laws  
Slight not the suffering while thou reck'st the cause  
How poor the solace when thy patients die  
To tell the mourners all the reasons why  
Love linked with knowledge crowns thy angel art  
Gold buys thy science —Heaven rewards thy heart

is the best discourse ever delivered in the Medical School of Harvard University. It abounds with bright thoughts and there is a kind of elasticity and vigor running through its pages that refresh the readers. In conclusion, we congratulate Dr. Holmes on the happy success of his first appearance in professorial character at the Medical College."

The story of Dr. Holmes's long connection of thirty-five years with the Anatomical Department is familiar to us all. He was, no doubt, not an eminent anatomist, but he was unquestionably a very great teacher, and by his felicity and clarity of exposition gave to thirty-five classes of students an accurate and fundamental knowledge of the most fundamental of all medical sciences. Nor was Dr. Holmes merely a reiterator of what was already known. His alert mind was always ready to assimilate new things and his introduction of the microscope into the teaching of anatomy may probably be regarded as the beginning of our modern Department of Histology and Embryology. To all who are interested in tracing the history of Dr. Holmes's contributions to the teaching and knowledge of anatomy may be recommended a thorough inspection of the admirable collection of data and memorabilia assembled with the greatest care and enthusiasm by Dr. Frederic T. Lewis and now on exhibition in Building B-2 of the Harvard Medical School during the Harvard Tercentenary.

In the department of gross anatomy we still cherish a few tangible reminders of Dr. Holmes. One is his so-called "star-muscle" preparation presenting still in well-preserved form a dissection which upon the authority of the late Dr. Thomas Dwight, Holmes must have made about eighty-five years ago, showing a fragment of the occiput, the upper cervical vertebrae, the recti capitis posteriores, majores et minores and the obliqui capitis, superiores et inferiores. This specimen is still used in routine teaching of first year anatomy.

We cherish with greater solicitude and no longer use on account of their fragility a series of some thirty anatomical drawings in color made by Dr. Holmes for teaching purposes. They show various of the bones and viscera, and there is a particularly admirable series of the ganglia of the autonomic nerve system. For the most part they are not original, but are copies from the illustrations of various standard books. Nevertheless, as an artist Dr. Holmes had an unmistakable style of his own, and though most of his known drawings are autographed, there are several not signed which it is easy to identify from our collection as his by their resemblances of style and technique.

Dr. Holmes's life-long interest in anatomy was shown also by numerous allusions in his

more purely literary works. In "My Hunt after the Captain", describing Dr. Holmes's quest for his son, the late Judge Oliver Wendell Holmes, when the latter was shot through the neck at the Battle of Antietam, there is an amazingly vivid, brief description of the anatomy of the neck. In another of his essays he refers to the sinking feeling of apprehension which one has in the semilunar ganglia under any sudden emergency. And so *passim* through his literary writings are allusions, expressions and references which only the anatomist would have conceived. In our anatomical teaching today we still cherish and use certain of his descriptive phrases which have been handed down through the years by word of mouth, such as his comparison of a sweat-gland with a fairy's intestine, of the mesentery to the frill of an old-fashioned shirt-front, of the fimbriated end of the fallopian tube to the ragged fringe of an old lady's shawl. And his description of the ischial tuberosities as "those interesting prominences whereon man sits to survey the works of creation" is a phrase whose felicity elevates the commonplace to the level of the sublime.

For thirty-five years, then, Oliver Wendell Holmes, as a practitioner of medicine, as a teacher of anatomy and as an essayist of unique genius, ruled medical and literary Boston as a genial autocrat, and it was only upon his retirement in 1882 that he relinquished the medical domain of this autocracy to his intimate colleague and friend, Dr. Henry J. Bigelow. As a man of letters, Holmes "lived to be the last leaf upon the tree," and until his death on October 7, 1894, remained the *genus loci* of the Back Bay.

As the remembrance of Dr. Holmes in *propria persona* lapses into the receding background of the past, I count myself particularly fortunate in being able, personally, to remember him, though I can only say *Vingilum vidi tantum*. When I was a small boy, in the late 80's, and my mother used to take me walking on the Commonwealth Avenue Park, I can remember distinctly that she pointed out to me his quaint, frail figure in frock coat and silk hat and said, "That is Dr. Oliver Wendell Holmes—remember that you have seen a very great man." I saw him several times thereafter. Once in particular, I remember seeing him stopping to look at the *crocus* which bloom so early in spring in some of the sunny front yards on Beacon Hill, and I always fancied it was on such an occasion that he must have conceived his felicitous phrase.

The spendthrift *crocus* bursting through the mold  
Naked and shivering with his cup of gold

I have the good fortune also to have in my possession what may be a unique copy of an unpublished poem by Dr. Holmes, which came to

The relief from labored breathing was immediate and the return of color striking. During the next two days the patient complained of pain but it quieted down on the third day. The hooks were left in place for four weeks.

**Result.** It is now one year since the injury. There has been no recurrence of the pectus excavatum. Union of the fragments is solid and the sternum is in excellent position.

#### THE VITAMIN C VALUE IN ORANGE AND TOMATO JUICE

Orange juice contains from two to three times as much vitamin C as tomato juice. Either of the juices loses vitamin C if allowed to stand before using. These results were announced by workers in the Bureau of Home Economics, U. S. Department of Agriculture, in an article published on September 5 in the *Journal of Home Economics*. The Bureau points out, however, that when tomato prices are much lower than orange prices it may be possible to get as much or more vitamin C protection per dollar from tomatoes.

The tests included both chemical analysis and feeding trials of four varieties of oranges, two from California and two from Florida — fresh pressed juice of tomatoes and juice from a brand of commercial canned tomatoes. The juice of the California navel oranges was slightly richer than that of the others but some of the other oranges were enough juicier so that the juice from a fruit of equal size gave as good or better protection. To obtain the same protection from tomato juice it would be necessary to give two or three times as much juice.

The investigators, Esther Peterson, Daniel Mary H. Kennedy, and Hazel E. Munsell, found that the canned tomatoes which they tested contained as much vitamin C as the fresh sample. These tomatoes were grown in different sections of the country and since there is a loss of vitamin C in canning, these results raise the question of the effect of soil and climate upon the amount of vitamin C formed in the plant.

The common household custom of squeezing orange juice at night to serve at breakfast causes a loss of 10 per cent or more of its vitamin C value, even though it stands covered in a refrigerator. Tomato juice from fresh or canned tomatoes also deteriorates when allowed to stand exposed to the air. This may amount to as much as a 40 per cent loss if the juice stands for several days.—*Bulletin U. S. Dept. of Agriculture*

#### DO YOU KNOW?

The usual period for an increase in infantile paralysis is at hand but this season so far has not witnessed any sensational outbreak. A few years ago

#### SUMMARY

Traction has been successfully used in the treatment of a case of acute traumatic pectus excavatum. The apparatus described is simple and can easily be fashioned from regular hospital equipment.

It was impossible to diagnose these cases until there was definite evidence of paralysis. In the light of increased knowledge it is known today that many cases of this disease may have little more than a sore throat and a stiff neck. The best prevention is to avoid exposure of children to crowds.

Twenty-five years ago this summer mothers everywhere hoped and feared at the mere mention of the dread words, cholera infantum. Then came public attention to the purity of the milk supply. The record in New York City is this: In the summer of 1910 3,598 children died from cholera infantum. In the summer of 1935 only 166. Had the rate for 1910 prevailed in 1935 nearly 5,000 children would have died.

Dean Carl W. Ackerman said: "What would happen to the health of the nation if research in medicine were directed by and for those who wished to take over the physician's practice for political or economic purposes?"

The first medical journal published in the United States appeared August 8, 1797, and was known as the *New York Medical Repository*. It was also the first scientific periodical of any sort to be published in this country.

The first children's clinic was established in 1862 at the New York Medical College under the leadership of Dr. Abraham Jacobi.

The examination of children before they enter school marks a high point in their careers. It has been established time and time again that children in good health make better progress than those who may be hampered by eye trouble, dull hearing, or any other unfavorable condition. Prompt discovery and remedying of defects and timely vaccination against smallpox and protection against diphtheria, may change the whole course of the child's life.

Fifty-nine per cent of the persons in the hospitals of the United States are in institutions for nervous or mental ailments.—Excerpts from the *Bulletin of the New York State Medical Society*

Between two breaths what words of anguish lie  
The first short gasp the last and long drawn sigh  
Thou who has aided with coercive thumbs  
The redlegged infant, kicking as it comes  
Thou who has tracked each doubtful lesion home  
With probe and scissors knife and enterotome,  
Short is the opening short the closing scene  
Nor deem it strange—since every reason flings  
Its sun or cloud on life's unguarded springs  
Since song or science love of fame or truth  
All feed like vampires on the brow of youth  
Since the red goblet shakes the hand that grasps  
And hot-cheeked beauty wastes the form she clasps—  
One half mankind should spend their time to make  
The pills and draughts the other half must take  
Oh! fertile source of never failing wealth  
Mysterious Faith! thou alchemist of health!  
But for thy wand how vainly should we strive  
To cure the world and keep ourselves alive!

\* \* \* \* \*

Peace to our banquet let us not prolong  
Its dearest moments with my idle song  
This measured tread of ever marching rhyme,  
Like clockwork pleases only for a time  
Too long repeated, makes our heart so sick  
We cut the weights to stop its tedious click  
Let sweeter strains our opening hearts inspire  
The listening echoes tremble round the lyre  
Dance! Bacchus! Hours of labor come again  
To lock the rivets of our loosened chain

Shine star of evening with thy steadiest ray  
To guide us homeward on our devious way

These verses which present little more than half of the poem are not only of interest in themselves but are typical of Holmes's qualities as a poet—his humor, his happy phraseology and his occasional sparks of the sublime. Two of the lines particularly deserve comment. That which refers to the brain as "The soul's own viscous" deserves immortality with other of his anatomic phrases, and his reference to the "undying mind" is another example of his abiding belief in the immortality of the Spirit. Son of a clergyman that he was, and Doctor of Medicine though he was, Holmes always maintained an invincible faith in the human soul. It was this which inspired not only his life but what are perhaps his greatest lines at the close of the "Chambered Nautilus" —

Build thee more stately mansions, O my soul,  
As the swift seasons roll  
Leave thy low vaulted past  
Let each new temple nobler than the last  
Shut thee from heaven with a dome more vast  
Till thou at length art free  
Leaving thine outworn shell by Time's unresting sea."

## ACUTE TRAUMATIC PECTUS EXCAVATUM

BY W. RUSSELL MACAUSLAND, M.D.,\* AND MICHAEL A. TIGHE, M.D.\*

**F**RACTURES of the sternum associated with depression of the bone are showing an increase in frequency due to automobile injuries in which the chest is compressed. In consequence the treatment of this type of fracture is gaining more attention. Operative reduction is usually considered imperative in these cases, but the difficulties attendant upon such correction are well known. A few operators have successfully used simple traction methods to correct malposition in a limited number of cases. It is to point out another successful application of traction in the treatment of acute traumatic pectus excavatum that the following case is reported.

G. D., male, aged 49, received a crushing injury to the chest in an automobile accident. When admitted to the hospital he was in extreme shock. He complained of considerable pain about the chest and the breathing was labored.

Physical examination showed the sternum to be deeply depressed into the chest cavity. There was marked tenderness over the sternum and over all the ribs on the right side. The chest signs were rales, shallow breathing, and marked cyanosis. The heart sounds were regular. The temperature was 98, the pulse 100 and the respirations 30. In addition to the fracture of the sternum there was a fracture of the inner condyle of the right femur.

Roentgenographic examination showed a fracture of the sternum in its middle segment with depression at the site of fracture. There was some

indication of fracture of the fourth rib in the axillary line on the right side.

*Treatment.* Five days after the injury when the patient had recovered sufficiently from the original shock traction was applied by Dr. Tighe and the writer in the following manner. Avertin was used

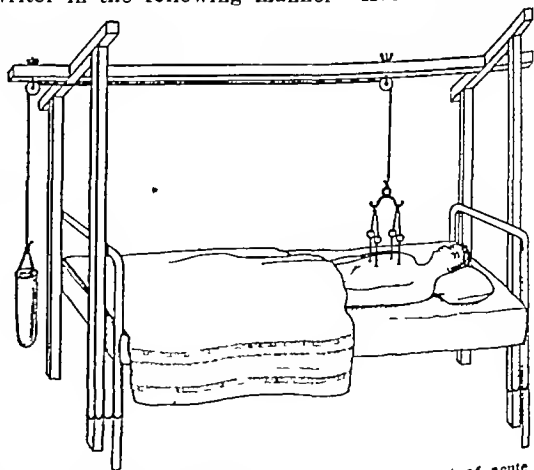


FIG 1 Traction apparatus used in the treatment of acute traumatic pectus excavatum

for the anesthetic. Four Steinmann pins which had previously been bent at one end to form hooks were caught under the margin of the sternum at the attachments of the ribs, two hooks being placed on each side, one above and one below the site of the fracture. Elastic bands were attached to the rings in the upper ends of the hooks and fastened in turn to a bar. This bar was then attached to the regular Balkan frame equipped with pulleys and six to seven pounds of weight were added (fig 1).

\*MacAusland, W. Russell—Surgeon in Chief, Orthopedic Department, Carney Hospital, Tighe, Michael A.—Surgeon, St. John's Hospital, Lowell. For records and addresses of authors see *This Week's Issue*, page 507.



in character. She was taking iron medication during this period. The jaundice and epigastric discomfort continued and there was some anorexia but no nausea, vomiting or diarrhea. Her weight diminished about eleven pounds in the last three weeks of her illness. X-ray examination in the Out-Patient Department showed no evidence of metastatic disease of the lumbodorsal spine. A gastrointestinal series showed a normal esophagus and no gastric retention. The gastroenterostomy stoma functioned well and the remainder of the intestinal tract was negative.

Physical examination showed a fairly well developed and nourished, pallid and icteric middle-aged woman in no discomfort. Oral hygiene was poor and there was patchy smoothness of the tongue. The heart and lungs were negative. The blood pressure was 120/80. The liver edge was smooth, rubbery and extended three fingerbreadths beneath the costal margin. The remainder of the examination was negative.

The temperature was 99.5°, the pulse 75. The respirations were 20.

Examination of the urine showed a specific gravity of 1.022 with a slight trace of albumin and a large amount of bile. The blood showed a red cell count of 4,700,000, with a hemoglobin of 75 per cent. The white cell count was 4,600. 78 per cent polymorphonuclears. Reticulocytes numbered 0.3 per cent. The stools were clay colored and showed no reaction for bile with the bichloride test. Several specimens gave a one plus reaction to the guaiac test. The van den Bergh showed 13 milligrams of bilirubin. The serum cholesterol was 232 milligrams and a fasting blood sugar was 98 milligrams. The Takata-Ara test was negative. The bleeding time was four and a half minutes and the clotting time was thirty-six minutes.

A plain x-ray film of the gallbladder region showed no evidence of stone. Further studies of the gastrointestinal tract showed no significant abnormality.

For a week after entry the patient improved slowly and the bilirubin dropped to 6 milligrams. On the ninth hospital day, however, she had an exacerbation of the epigastric pain and her urine became darker in color. The van den Bergh rose to 10 milligrams. Supportive treatment was instituted and on the twenty-second hospital day a laparotomy was performed.

#### DIFFERENTIAL DIAGNOSIS

DR RICHARD H. MILLER: "The patient had suffered from a sensation of epigastric fullness and heaviness after meals for about twenty years. I assume that that has been more or less continuous and steady and at once one must say it is unusual and is unlike ulcer, be-

cause ulcer would not persist in that way. Occasionally it was relieved by gaseous eructations and occasionally by vomiting, and then four years before she came in she felt weaker, was sicker, and had pain and more vomiting. There was no evidence of blood in the stool or vomitus. The doctor felt that she was anemic. Assuming that this was perhaps some unusual organic lesion one would nevertheless think that now she had begun to bleed a certain amount. She was improved after taking liver. The trouble, however, continued, and although the discomfort was occasionally relieved by soda and Seidlitz powders, it was not entirely cured.

"She was always hungry, ate a great deal but never was satisfied." That to me is hard to explain. Today we talk more or less about the condition of hyperinsulinism, due to lesions of the pancreas, and associated with excessive need of sugar, but that condition is not characteristic of what we see here.

"She vomited occasionally in the morning and then developed frequent shooting pains in the left loin and later a dragging sensation in the right subcostal region." These symptoms are not particularly characteristic of anything and I will postpone comment on them for the present.

"Throughout her illness weakness was progressive. There were crawling sensations in her feet and tingling numbness in her fingertips." We noted before that the doctor said she was anemic and with the onset of these nervous manifestations I think one might fairly assume that perhaps she was developing a more definite anemia, whether pernicious, I do not know, but it is suggestive of that.

The physical examination as we run through it briefly is essentially negative.

As to the laboratory work, the blood showed a red cell count of 3,600,000 with a hemoglobin of 70 per cent, a little low, but not a very marked degree of anemia.

The interesting thing is the fact that she had practically no acid in the stomach and yet at the same time she had a positive guaiac test. That makes one suspect she presumably has not an ulcer, because ulcer, almost invariably, is associated with high acidity. One thinks she has not cancer, or she probably would have died long before. Yet here is something that has been going on for twenty years associated with anacidity and blood, and it is pretty difficult to say exactly what it might be. If one did a lot of stomach work one might arrive at a presumptive diagnosis of polyp, as was later found.

The x-ray showed that there were two definite filling defects in the antrum near the pylorus each 3 mm in diameter with sharp smooth borders and the barium passed into the duodenum. Having arrived at that point it seems to me

# CASE RECORDS of the MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED  
IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 22371

## PRESENTATION OF CASE

*First Admission* A forty-one year old Canadian housewife was admitted complaining of indigestion and weakness.

The patient had suffered from a sensation of epigastric fullness and heaviness after meals for about twenty years. Occasionally this was relieved by gaseous eructation but rarely was she compelled to vomit. About four years before entry she felt quite weak and developed ready fatigue. The epigastric discomfort became worse and was associated with pain and vomiting. There was no evidence of hematemesis or melena. She consulted a physician who told her she was anemic and recommended liver extract. She took three vials of this extract daily for a month and improved rapidly. There were no further complaints until six months before entry, when she became quite weak and developed aching pain in the mid-abdomen. This occasionally occurred after meals and sometimes persisted throughout the day. Frequently there was no pain for several days. The discomfort often was relieved by soda and Seidlitz powders and had no effect upon her appetite. She stated that she was always hungry, ate a great deal but never felt satisfied. Vomiting usually occurred in the morning, was never large in amount, and appeared as clear green, bitter tasting material. For about four months there were frequent shooting pains in the left loin and two months ago she developed a dragging sensation in the right subcostal region. Throughout her illness, weakness was progressive. There were crawling sensations in her feet and tingling numbness in her fingertips. Palpitation and dyspnea with exertion were prominent.

Physical examination showed a fairly well-developed and nourished middle-aged woman in no discomfort. The sclerae were clear but the skin had a slightly pallid yellowish tint. Oral hygiene was poor and the tongue showed smooth edges but was otherwise negative. The heart was not enlarged but there was a soft blowing systolic murmur in the pulmonic area.

The blood pressure was 120/70. The lungs were clear. The liver extended two fingerbreadths beneath the costal margin, but the spleen was not palpable. There was slight tenderness in the epigastrium with deep pressure. The deep reflexes were normal and no impairment of the vibratory sense was elicited.

The temperature, pulse and respirations were normal.

Examination of the urine was negative. The blood showed a red cell count of 7,600,000, with a hemoglobin of 70 per cent. The white cell count was 4,800, 79 per cent polymorphonuclears. There were 18 per cent reticulocytes. A gastric analysis showed no free hydrochloric acid after the administration of ergamin. The total acid was 4. All specimens gave a positive reaction to the guaiac test, although a stool specimen gave a negative reaction. A Hinton test was negative.

X-ray examination showed the esophagus and upper stomach to be normal. Occupying the antrum of the stomach and lying beside the valve on the greater curvature side were two filling defects, each measuring 3 centimeters. These had very sharp, smooth borders and the greater curvature in this region was also smooth. Peristalsis began high up in the stomach and proceeded normally down to the filling defects, where it ceased abruptly. Barium, however, could easily be pressed into the duodenum and the duodenal cap and loop were normal. An x-ray of the chest showed several large calcified glands at the right lung root and mediastinum. There were also calcified glands in the left axilla. The lung fields were clear and the heart was normal.

On the fifth hospital day a posterior Polya gastric resection was performed. The pathologic report was polyp. The sections, however, were somewhat atypical, and due to the delay in fixation the autodigestion was too great to allow for a certain diagnosis. The patient responded well postoperatively and was discharged on the nineteenth hospital day.

*Final Admission*, three and a half years later.

Following her discharge the patient felt very much improved and had no significant symptoms until nine weeks before her re-entry. At that time she noted dull aching pain on either side of her spine in the lower dorsal region. These pains came on only when she reclined at night and were sufficiently severe to disturb her sleep. Six weeks before admission the pain, still aching in character, began to radiate anteriorly along the rib margins bilaterally and occurred during the day as well as night. After four more weeks she developed epigastric discomfort evidenced as a sensation of heaviness associated with malaise. At about the same time jaundice was noted and the stools appeared tarry.

weight anemia and jaundice and the case seemed to come unquestionably under the head of malignancy, either in the stomach originally or in the pancreas. She had two things that made us consider the possibility of common duct stone. One was the smooth, rather normal feeling liver and then the remission of the degree of jaundice which occurred about ten days after her entrance, but that rapidly came back to the point at which it was when she came in. Our feeling was that she probably had what Dr. Miller has described, but she might well have a carcinoma of the pancreas. That was based on the pain referred to the back as much as on any other single thing.

DR HORACE K. SOWLES. I saw this woman in consultation as to whether we would advise surgical procedure. I made a note on the record at that time that I felt the jaundice was probably due to intrahepatic disease and metastatic carcinoma in the liver. I felt that exploration was justified on the basis that the jaundice was probably caused by pressure upon the common duct and that we might be able to relieve the jaundice by doing an anastomosis between the gallbladder and the intestinal tract.

DR GEORGE A. LELAND. I think this case is of considerable interest in many respects. In the first place, if one is going to maintain the diagnosis of recurrent carcinoma of the stomach secondary to malignant polyp, one has a right to assume that the x-ray would show some deformity and in this case there seemed to be a very nice looking anastomosis between the stomach and the jejunum without any distortion whatsoever. It so happens, however, that cancer recurrence following gastric resections is not always detectable by x-ray. I think the first case in which Dr. Benedict differed from the x-ray department's findings several years ago, in his early experience with gastroscopy was in just such a case as this, where there had been a resection for carcinoma. Dr. Benedict was able to detect carcinoma where the x-ray was perfectly negative. We felt very much as did Dr. Sowles, and also as Dr. Miller that the polyp had been malignant and there was recurrence with pressure on the ducts. We also had in mind the possibility of carcinoma of the pancreas, as Dr. Blake has pointed out because of this back pain. The pain that follows the rib margins and the back pain that is more severe at night is very apt to originate from pancreatic malignancy.

Exploration was performed with the hope and expectation of doing a cholecystoanastomosis to relieve her of the jaundice. As you can imagine, there were a great many adhesions in the right upper quadrant but with considerable dissection a hard mass was found in the vicinity of the stump of the stomach and the head of the

pancreas. The common duct was dilated. There was apparently pressure from infiltration of disease up above the cystic duct, so that cholecystoenterostomy probably would not have given any relief. It was not apparent from the exploration up to this point where the disease had originated, whether it was pancreatic or gastric.

#### CLINICAL DIAGNOSIS

Carcinoma of the pancreas

DR RICHARD H. MILLER'S DIAGNOSIS

Recurrent adenocarcinoma in the retroperitoneal space, originating in gastric polyps

#### ANATOMIC DIAGNOSES

Carcinoma of the pancreas with metastases to the regional lymph nodes

Bile stasis and ? toxic hepatitis of the liver  
Operative wound. Cholecystostomy drainage of the pancreas

Operative incision. Posterior gastroenterostomy and excision of a gastric polyp  
Peritonitis acute and chronic localized, upper abdomen

Pulmonary atelectasis

Pulmonary congestion

Arteriosclerosis, slight aortic

#### PATHOLOGIC DISCUSSION

DR. TRACY B. MALLORY. This case provides me a useful opportunity to point out one thing. The enthusiasm of the surgeon who first operated in this case to have a photograph taken resulted in the specimen spending three days in the photographic laboratory and reaching us in such an advanced state of decomposition that microscopic examination was out of the question. Decisions as to whether polyps in the stomach are malignant or not are very difficult and often depend on minute cytologic details so that unless the specimens are very fresh they are of practically no use.

The autopsy showed that there was a very large tumor in the head of the pancreas. Our impression was that it was probably primary there. In cases of recurrence of stomach cancers it is not infrequent to have a mass develop in the region of the pancreas but it is generally possible on gross examination to dissect it sufficiently to show that the mass is primarily in the lymph nodes very intimately attached to the pancreas. In this case, although lymph nodes were involved, the main mass was in the pancreas itself. Also, the histologic character of the final specimen is pretty much that of pancreatic cancer, although I do not think that microscopic examination is nearly so important as the gross appearance in deciding between these two.

I think Dr. Miller was probably right in as-

that the diagnosis can be made before operation on the basis of anacidity, two filling defects and blood in the gastric content and polyps of the stomach would fit that perfectly well.

"There were several calcified glands at the right lung root and in the mediastinum." I think they were not related to this condition and were probably old tuberculous lesions, and the same applies to the calcified glands in the left axilla.

The pathologic report was polyp, macroscopically. The specimen was not fixed in time so there was no microscopic examination. Polyps of the stomach, as I said a moment ago, are associated with bleeding and anacidity. They are usually benign.

Following this operation she was well for a little over three years and came back then stating that she had been sick for nine weeks. At about that time she began to be jaundiced and although the stools were tarry in character she was taking iron, which might very well have explained it. The jaundice and epigastric discomfort continued. The weight decrease of eleven pounds itself suggests that something very serious was developing.

This recurrence of trouble after three years suggests that something very definite must be going on in the retroperitoneal space around the lower dorsal spine. One is forced to think that perhaps there is some growth which starts out by pressing on the nerves around the vertebral column itself, then on the intercostal nerves, and then perhaps extends enough to press on the common duct. (Demonstrating x-ray film.) I am not good at interpreting x-rays but it would appear that the lower half of the stomach was cut across here and the jejunum was anastomosed to it, and from these x-rays I should judge that the stomach was functioning perfectly normally. One sees clear outlines of the vertebrae, thus ruling out any disease in them.

Physical examination was again essentially negative, except that she was jaundiced and the liver edge was smooth, rubbery, and extended three fingerbreadths below the costal margin. She had been jaundiced quite a number of weeks, the liver was barely palpable four years ago, and I think this enlargement can be perfectly well explained by the backing up of bile into the liver.

We can deduce from the examinations of the urine that the kidneys have now begun to show damage, probably as a result of bile in the blood. There was no anemia at this time. The white count was not remarkable. The reticulocytes were within normal limits. The stools were clay colored and showed no bile. Several specimens of the stool gave a 1 plus guaiac test. I should judge that in any woman with so much jaun-

dice one could assume that there was a little bleeding from minute lesions anywhere in the gastrointestinal tract, and I think that the finding of that amount of blood is not particularly important and does not necessitate a search for any gross lesion.

The van den Bergh finding was distinctly elevated and is again evidence of excessive bile. The normal serum cholesterol varies from 140 to 190 and there have been very complicated findings in regard to cholesterol in cases of liver disease and jaundice, and the reports in the literature have been so contradictory that it is hard to draw any definite conclusion, but in jaundice and in liver damage, cholesterol is usually elevated, so that this simply fits into the picture. I am not familiar with the Takata-Ara test. I know it is a liver function test which is positive in many cases of portal cirrhosis, and this negative result would simply suggest that it was not a case of portal cirrhosis.

After a week in the hospital she improved and on the ninth day had an exacerbation, got worse again, but after a period of days she improved and was explored. I do not believe I would have explored her myself. I think exploration was probably merely a diagnostic procedure.

To go back to the entry four years ago, she had two polyps. Polyps are usually benign but in a certain percentage of cases they do become malignant. In this case the microscopic examination was impossible, therefore, I saw that she had adenocarcinoma of these polyps and that, at the time of operation, cancer cells had already migrated into the retroperitoneal space and started a metastatic growth. The operation relieved her for three and a half years, because the actual cause of her symptoms was relieved. But in the meantime the malignant growth was continuing in the retroperitoneal space, and then nine weeks before her second entry the growth had become large enough so that it was pressing on the nerves, and finally, as I said previously, caused obstruction to the common duct. Therefore, in my opinion, she had metastatic adenocarcinoma in the retroperitoneal spaces and that was the cause of her symptoms on her second entry. I am inclined to believe that at the second operation a large mass was found behind the stomach that nothing could be done, and that she was sewed up, and that if she did not die of peritonitis or what we loosely and perhaps incorrectly call a liver death, she probably died of renal insufficiency that was secondary to bile in the blood and liver insufficiency. She probably died in coma and had convulsions.

#### CLINICAL DISCUSSION

DR. GERALD BLAKE. On admission to the medical ward this patient had weakness, loss of

appears to have no bearing upon the present illness. It seems he was gassed in the war and thereafter had what was described as bronchitis with asthma. I suppose we might assume he had bronchitis which had bothered him all the years. The present illness begins three months before entry with what he described as a "cold." He developed a sharp pain in the left chest near the edge of the sternum, a pleuritic type of pain. When I first read about the appearance of a lump in the left axilla I thought of an empyema which had broken through the so-called empyema necessitatis but as we read along in the history we learn that this lump was not found.

The physical signs suggest some degree of atelectasis which may have been responsible for the shift in the heart and the trachea. There were signs at both bases which he must have had for many years with rales and some dullness. The outstanding thing of course is the presence of this tumor mass in the axilla with a dull area beneath it—suggesting an area of consolidation. The pectoriloquy may possibly mean some cavity formation.

We have nothing to suggest that he had a lung abscess or that the lesion was secondary to an old infected bronchiectatic lung. It seems like something that has developed recently and independent of the old chronic disease which he has had.

The x-ray examination suggests the presence of a neoplasm. I wondered as I read it if one would be able to see the arc-shaped shadow which Dr. King has pointed out and which we have associated with certain cysts and abscess cavities which contain an inspissated type of pus. Here is the axillary mass and we see that the ribs are definitely involved in a tumor if it is a tumor. It was believed that the tumor communicated with the bronchus. That is an important observation, it seems to me in making a diagnosis of the type of tumor this man had.

It would seem that we are dealing here with a neoplasm, the important thing being to decide just what type of neoplasm it is. In the first place I think it would be very unusual for a bronchiogenic carcinoma to produce this picture. I have seen them grow through the chest wall, but it is not common. There was definite invasion of the ribs. Although there was some evidence of bronchial obstruction, it does not seem to have been an outstanding finding. On the other hand, a metastatic growth in the lung rarely causes any bleeding, and in fact I think probably almost never does, a fact which must be considered too. If we are dealing with a metastatic growth the kidneys have been ruled out pretty well as a source. The prostate has been ruled out. We have no indication as

to where it might have arisen. The fact that the bone is involved might possibly suggest a primary bone tumor (sarcoma), but there again it would be most unusual for a tumor arising in the ribs to invade the lung and cause bloody sputum. I cannot make a definite diagnosis except that I believe this lesion is neoplastic and probably a carcinoma of the lung invading the chest wall. I think the fact that the axillary tumor is solid and adherent rather than fluctuant, is important in ruling out an inflammatory process.

DR DONALD S. KING: The lateral film is interesting because it shows the tumor mass apparently at the hilum of the lung, and one would never conclude from studying this film that the tumor was located in the axillary line. We thought at first that we were dealing with a chondrosarcoma starting in the rib but as Dr. Sweet has pointed out a chondrosarcoma would not give the bloody and purulent sputum and would not invade the lung as this tumor has done. We have had several cases of chondrosarcoma where the tumor could be removed with the rib and easily separated from the underlying lung.

#### CLINICAL DIAGNOSIS

Carcinoma of the lung

DR RICHARD H. SWEET'S DIAGNOSIS

Carcinoma of the lung invading the thoracic wall

#### ANATOMIC DIAGNOSES

Epidermoid carcinoma of the lung, grade I, with invasion of the pleura, ribs, and thoracic wall.

Pulmonary emphysema, right apex.

Pleuritis, chronic, fibrous.

Arteriosclerosis.

Operative wounds. Intercostal neurectomy, biopsy of the chest wall.

#### PATHOLOGIC DISCUSSION

DR TRACY B. MALLORY: A biopsy done on the mass just before the intercostal neurectomy, showed an epidermoid carcinoma. At autopsy we found a large cancer mass occupying the major part of the upper lobe of the left lung. The major bronchi were uninvolved but one of the secondary branches ran directly into the tumor and we thought that it in all probability was the source of the tumor. The bronchial glands were entirely free from metastasis, a surprising finding with such an extensive tumor since the ordinary extension of the bronchial cancer is toward the hilum, with fairly early involvement of the regional glands. In this

suming that hepatic insufficiency played a major rôle in death. The liver at the time of autopsy was quite small, weighing only 1000 grams. It had been drained through a tube in the gallbladder, I think. Do you know whether it drained adequately, Dr Leland?

DR LELAND: I did not have the operative notes here and I forgot about that. A tube was placed in the gallbladder. Cholecystenterostomy was not performed because of pressure on the common duct above the cystic duct. The drain was put in in the hope that by decompressing the gallbladder there might be sufficient diminution of congestion to allow temporary relief.

DR MALLORY: At any rate the liver had shrunk considerably and showed a very extensive degree of necrosis that was obvious in gross and in the microscopic examination. I think liver insufficiency, plus hemorrhage, probably was the immediate cause of death.

A PHYSICIAN: Was the bone marrow typical of pernicious anemia?

DR MALLORY: No.

## CASE 22372

### PRESENTATION OF CASE

A fifty-five year old Canadian electrician was admitted complaining of pain in the left chest.

Eighteen years before coming to the hospital the patient had been gassed while a member of the Canadian army. Since that time he suffered from "bronchitis and asthma", and was under constant supervision of physicians in various hospitals. Three months before entry following a cold the patient had a sharp pain in his left chest near the edge of the sternum which was increased with coughing or deep inspiration. At the same time there was a cough productive of yellowish white material which had neither bad odor nor taste. The cough persisted until entry and five days before admission the sputum was streaked with bright red blood. For about a month the patient had noted a tender lump about the size of a small egg in the left axilla. There was a loss of six pounds in weight during the preceding three months. The appetite was poor and there was frequent sweating. The patient had not worked for eighteen years.

Physical examination showed a thin, pallid, middle-aged man who coughed fairly frequently. Arcus senilis was noted and there was slight ulceration of the right lower gum. There was a firm slightly tender mass attached to the left chest in the left axilla just below the third rib. The mass was noted to be half the size of an egg and was firmly adherent to the surrounding tissues. The left border of the heart was 2 centimeters beyond the midclavicular line and the trachea also appeared to be displaced to

the left. The heart sounds were faint but regular and no murmurs were heard. Chest expansion was poor. There was dullness at both bases posteriorly, more on the left, and most pronounced in the left axilla in the region of the mass noted. Coarse bubbling and musical râles were heard at both bases and in the left apical region. At the left base distant bronchovesicular breathing was heard and there was pectoriloquy in the left axilla below the third rib.

The temperature was 99.2°, the pulse 104. The respirations were 24.

Examination of the urine was negative. Several sputa examinations were negative for tubercle bacilli and spirochetes. The material was purulent in character.

X-ray examination showed a large lobulated mass in the lateral portion of the left mid chest. There were two main lobulations and lying within each was an area of decreased density without evidence of fluid levels. The outline of the mass was continuous with a similar smaller rounded soft tissue tumor in the axilla and there was a fracture of the sixth and seventh ribs in this region with destruction of the bone about the fractures. It was believed by the roentgenologist that the tumor communicated with a bronchus. One of the pyelograms showed the right kidney to be normal. The left kidney was partially obscured by gas and the pelvis and calices appeared to be somewhat dilated. They showed no evidence of defect in their outline, however. A genito-urinary consultant found no evidence of abnormality of the prostate, urethra or bladder.

The patient continued to cough up about two ounces of frothy, blood-streaked sputum daily. At the end of the first week he began to show an irregular rise of temperature up to 102°. The blood showed a red cell count of 5,200,000, with a hemoglobin of 70 per cent. The white cell count was 15,000, 48 per cent polymorphonuclears, 42 lymphocytes, 4 monocytes, 2 basophils, 2 eosinophils and 2 myelocytes. The amount of sputum produced each day gradually increased to about 7 ounces. The patient had considerable pain in the axillary mass and on the fifteenth hospital day an intercostal neurectomy of the left fourth to ninth intercostal nerves was performed. On the following day the patient became cyanotic and appeared dyspneic. He had choking spells accompanied by cough and the production of thin grayish sputum. His condition became progressively worse and he died on the seventeenth hospital day.

### DIFFERENTIAL DIAGNOSIS

DR RICHARD H. SWEET: This man is a fifty-five year old Canadian electrician who had not worked for eighteen years so that his occupation

appears to have no bearing upon the present illness. It seems he was gassed in the war and thereafter had what was described as bronchitis with asthma. I suppose we might assume he had bronchitis which had bothered him all these years. The present illness begins three months before entry with what he described as a "cold." He developed a sharp pain in the left chest near the edge of the sternum, a pleuritic type of pain. When I first read about the appearance of a lump in the left axilla I thought of an empyema which had broken through, the so-called empyema necessitatis, but as we read along in the history we learn that this lump was not fluid.

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Pulmonary emphysema, right apex

Pleuritis, chronic, fibrous

Arteriosclerosis

Operative wounds: Intercostal neurectomy, biopsy of the chest wall

#### PATHOLOGIC DISCUSSION

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case there was no extension to the hilus but a progressive peripheral extension to and through the pleura. It had grown directly through the ribs and was just about to go through the skin at the time of the patient's death.

Microscopic examination of the tumor showed a highly differentiated epidermoid carcinoma. It appeared microscopically to be very slowly growing and could not be graded higher than group I, in the usual four grade system for estimating the malignancy of a tumor. It is in-

credible that he had had the tumor only three months. I do not believe either that he had had it eighteen years, and the probable interval is somewhere between the two. My guess is that he must have had it for two or three years. There was a great deal of necrosis in the center of the tumor which perhaps accounted for the differences in density in the x-ray shadow. Quite in character with the low grade of malignancy from the microscopic point of view was the fact that we found no distant metastases.

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## ERUPTION FOLLOWING THE USE OF CERTAIN CHLORINE COMPOUNDS

THE report of "epidemics" of acneform eruptions in workers coincident with the introduction of some of the newer chlorine compounds into industrial processes has directed attention to a new industrial hazard. At least three groups of such cases have occurred—one of them in Massachusetts with about thirty-five or forty cases. Chlorinated naphthalene and chlorodiphenyl are new chlorine preparations added, under various trade names, to waxes with the idea of lowering the melting point of the compound in order to improve the insulation qualities of cables. These waxes have a relatively low viscosity and a low coefficient of expansion. They are noninflammable and readily impregnate the fabrics used on the cables. They are therefore advantageous to industry. The fabric of the cable is impregnated with this melted wax at a relatively high temperature or by immersion in the wax with the addition of some diluent such as carbon tetrachlo-

ride or ethylene dichloride. Both the individuals exposed in the manufacture of the cables and the workmen handling the cables in the process of installation come in contact with these substances in solid, liquid, vapor or dust state of the wax. The skin in those persons affected shows comedos and small papules in the earlier stages and pustules and small cysts later, often ending in some scarring. The face, neck, arms, upper back and thighs are most frequently affected. Numerous cases have shown profuse involvement. Even a child of two and one-half years has been reported with the condition probably from playing with its father in his work-clothes and sleeping with him. The wife also showed involvement. From two to fifteen months' exposure is apparently required before the appearance of the eruption.

In a recent examination of 100 persons exposed either to the solid, liquid, or vapor state of the wax, 78 per cent were found to be affected to some extent with this dermatitis. In certain of these cases the matter of systemic effects was partially investigated but no definite effects were found. This matter should be further studied as well as the possibility of throwing some light on the mechanism of adolescent acne.

The occurrence of such an industrial dermatosis with the disfigurement which occurs in these cases and the possible disability which may result demand emphasis. Physicians should be awake to another factor in the production of acne-like eruptions and should participate in efforts to detect these cases early and aid in the necessary preventive measures. It would seem that with the high percentage of involvement some change in the compounds used, or in the method of handling these chlorine compounds, should be adopted. Furthermore, strict preventive measures should be instituted in all occupations in which such compounds are being used with the idea of lessening the opportunity of contact. With the accentuation of already existing acne in young individuals it would be advisable, so far as possible, to employ an older age group of workmen where the greatest exposure occurs. Adequate cleansing facilities, both for skin and clothing, should be initiated, and improved blower systems, and so forth should be considered as necessary procedures. Perhaps a harmless protective coating could be applied to the cable to protect the handlers of the finished product.

## ARTIFICIAL ABORTION

ON November 18, 1920 a decree was issued in Russia permitting artificial abortion for medical and social indications under the following conditions: primigravidae were not to be aborted except for medical reasons unless they insisted

after an explanation of the dangers involved, no woman was to have her pregnancy terminated later than twelve weeks after her last period or earlier than six months following a previous abortion. As time went on the practical application of the law was that any woman who wanted her pregnancy ended could have it done. Although the Soviet government did not definitely so state, the motive was apparently Neo-Malthusian in that an attempt was made to restrict the population so that it would not exceed the available means of subsistence. Government hospitals known as *abortaria*, were established where the operation was performed openly by skilled surgeons. In a review of the reasons given by the women for desiring abortion, Kailin<sup>2</sup> found that 41 per cent were in financial distress, while the remainder expressed the desire for economic independence, the wish to participate in political and social life, to enjoy the opportunity for education or to avoid the irksome duties of domesticity. Medical indications appear to have been rare. Aside from poverty the chief motive seems to have been selfishness. So began an experiment, viewed with interest by physicians and sociologists throughout the world, which is now, after sixteen years probably to be abandoned, for on May 26 of this year a bill was proposed to make optional abortion illegal and to punish by imprisonment any physician or other person who should terminate pregnancy unless for medical indications. This bill has not yet become a law. It has been offered for public discussion and criticism before final action is taken.<sup>1</sup>

The Soviet government gives as its reasons for this astonishing change of policy an improved conscience among the Russian people and a generally higher cultural and material level. The jaundiced Western eye, however will look more deeply for the real answer. Those of us who have pictured a high immediate death rate following interference with gestation on so wholesale a scale will find little comfort in the actual facts. Madzugin<sup>3</sup> in 1933 reported 86,000 artificial abortions in Moscow with no deaths, Karlin<sup>3</sup> records 7,402 and Topuse<sup>4</sup> 14,270 both series without mortality. In 1927 Genss<sup>5</sup> reported 201,480 legalized abortions in all the Russian cities with a death rate of one in twenty thousand. In general, artificial abortion killed practically no patients and the criminal or amateur abortionist, in the cities at least, disappeared from the scene. Moreover Genss also states that, in spite of the large number of pregnancies that were so ended in the early weeks, the birth rate showed no appreciable fall and still remained among the highest in Europe.

Considerable light on the possible reason for the abandonment of the Russian experiment is thrown by certain articles which have from time

to time appeared in the literature. Bublitshenko,<sup>6</sup> in studying 200 women with induced abortions, found that 86 per cent of those up to thirty-five years of age remained sterile and that 57 per cent had chronic pelvic inflammation. Krassilnikian<sup>7</sup> reported that 43 per cent of aborted women had pelvic pathology, while Belgajeva<sup>8</sup> noted that one of every seven women had bleeding, salpingitis or parametritis within ten days after the operation. Other observers found long labors postpartum hemorrhages and adherence of the placenta in subsequent pregnancies. Since the stay in the *abortaria* was only three or four days, the development of sequelae would not be noted in these institutions, but would come under the observation of the regular gynecologic clinics. It appears, therefore, that although legalized abortion was seldom fatal, it left in its wake a considerable amount of wreckage.

The number of criminal abortions occurring each year in the United States can only be surmised. In Taussig's<sup>9</sup> excellent book on abortion, he places the probable total number of all, spontaneous therapeutic and illegal as about 681,000. He believes that 60 to 65 per cent are criminal. If we take a mean of 62.5 per cent we arrive at 425,625 criminal abortions as a purely hypothetical figure. In the opinion of the same authority there are between 8,000 and 10,000 deaths each year, almost all following criminal operations. Not all illegal abortions are performed by physicians, midwives, trained nurses, the patient herself or her friends and well-wishers may have been guilty. Without holding any brief for the professional, it is evident to all that he does less harm than the amateur, who without regard for asepsis uses the catheter, slippery elm stick, crochet needle hair pin, buttonhook or, in fact, almost any appropriate article that may be found about the house.

Attempts to punish the criminal abortionist are seldom fruitful unless the woman accenses him by an antemortem statement, and not always then. If she does not die it is almost impossible to make her testify. In some states she is regarded as a *particeps criminis* and her own testimony will convict her. Moreover, the average jury sees little sin in the destruction of a fetus before the mother has felt it move and finds it difficult to regard it as a living individual, although all biologic knowledge is to the contrary. In line with the same so-called reasoning is the common law, which, as interpreted in many states, holds it not a crime to provoke an abortion before the date of quickening. The only practical aid in the solution to the question of criminal abortion in the United States is a more general knowledge and application of contraception. In this way alone can the appallingly large number of deaths be reduced.

While the physician, who in good faith, performs a therapeutic abortion to save the life or preserve the health of a patient is happily safe from prosecution in this country, the statutory law in many states is far from clear. In Massachusetts unlawful abortion is a crime, but lawful abortion is not defined. In New Hampshire there are no qualifications, although in Maine Rhode Island and Connecticut the uterus may be emptied legally to save the life of the mother. The ideal law, as suggested by Tausig, if uniformly adopted throughout the country would clarify this puzzling situation. It provides that therapeutic abortions may be performed only by registered physicians, in licensed hospitals and in consultation with another physician. The operation is permitted only to save the mother's life or to preserve her health, or in cases of physical depletion or of moral irresponsibility. Such a law should satisfy all reasonable persons who are free from bias and who sincerely believe it their duty to protect the welfare of their patients.

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This is the third human case of plague reported in the United States thus far this year one of the others also occurring in California while the third was near Beaver Utah.

Plague has been ever present in the rodent population in California since an outbreak of human plague occurred in San Francisco early in this century. The disease is transmitted from rats or other rodents to human beings by fleas. Plague-infected ground squirrels have been found as far east as Montana and Utah and these animals are a potential source of danger to human beings.

Concerned at the spread of plague among the rodents the U. S. Public Health Service last year doubled its plague-fighting force on the West Coast assigning two officers to the work instead of one. The California State Health Department also carries on extensive anti-plague operations—*Science News Letter* August 29 1936.

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# HEALTH OFFICERS MONTHLY STATEMENT OF VENEREAL DISEASES REPORTED IN THE NEW ENGLAND STATES

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State	Syphilis		Gonorrhea	
	Cases Re-ported Dur-ing Month	Monthly Case Rates per 10,000 Population	Cases Re-ported Dur-ing Month	Monthly Case Rates per 10,000 Population
Connecticut	224	135	146	88
Maine	30	37	35	44
Massachusetts	423	98	406	94
New Hampshire	8	17	12	26
Rhode Island	106	150	39	55
Vermont	26	72	26	72

Treasury Department—U S Public Health Service

## POLIOMYELITIS

The outbreak of poliomyelitis that began in Alabama during the early part of July has apparently been confined to that State and adjoining States in the East South Central region. For the four weeks ended August 8 Alabama reported 129 cases, Tennessee 99, Mississippi 32, and Kentucky, 11—more than one half of the total cases occurred in those four States. No other State or region reported more than the usual increase that is expected at this season of the year.

The total number of cases reported for the country as a whole was 515 which was about 35 per cent of that reported for the corresponding period of 1935. In that year an epidemic that started in North Carolina reached its peak in the South Atlantic region during this period and had spread into states along the North Atlantic seaboard.

The summer rise of poliomyelitis in recent years reached its peak about the third week in September. This year each region reported the usual increase in this period over the preceding period but the figures compare favorably with those for this season in recent years when an epidemic was not in progress.—*Report of the U S Public Health Service*, August 28, 1936

## TRUANTS FROM MEDICINE FOUND FAME ELSEWHERE

The gifts of medicine to humanity—conquests of diseases, relief of suffering and prolongation of life—have never been minimized. Yet from early times there have been medical men who, turning aside

from their profession have made outstanding contributions in other than medical fields.

A roster of these medical "truants" was called by Lord Moynihan\* of Leeds in the latest Linacre Lecture at Cambridge University, given in memory of one of the earliest and most distinguished of the truants from medicine. In this lecture now available in book form (*Truants*, Cambridge University Press), Lord Moynihan refers to some hundred men, trained as physicians, who won distinction as writers, artists, scientists, statesmen, explorers, actors and even athletes.

Among the latter, Lord Moynihan lists the great cricketer, W G Grace, Lennard Stokes, outstanding Rugby player, and the lawn tennis player, Joshua Pim, who won four championships.

Most persons will recall that Clemenceau deserted medical practice for politics that Keats and Goldsmith studied medicine that Oliver Wendell Holmes carried on simultaneously in medicine and literature winning fame not only as the author of the *Breakfast Table* series but also as the first person to point out that puerperal or childbed fever is contagious.

The name of Sir Francis Seymour Haden is well known in the art world but perhaps less well known is the fact that this eminent etcher carried on a large and important medical practice often making professional rounds with an etching plate in his pocket.

"Sherlock Holmes" owed his methods of solving a mystery to the fact that his creator, Conan Doyle, studied medicine under Joseph Bell a Scottish surgeon, who impressed on all his pupils the endless significance of trifles and of small distinctions."

JOHN BULL

The name of John Arbuthnot, physician and wit of the early 18th century, may not be familiar to many 20th century readers but who does not know John Bull? This famous character and name was probably created when Arbuthnot published *Law in a Bottomless Pit, or the History of John Bull*, Lord Moynihan states.

A physician of the 16th century, William Gilbert, gave the word electricity to the English language, while important additions to knowledge of electricity were made by an Italian physician Galvani. Copernicus the founder of modern astronomy, Linnaeus father of modern scientific botany, Galileo, Robert Boyle—all held medical degrees and are ranked with the other "truants" by Lord Moynihan.

Honor of being the first truant goes to Imhotep, the Egyptian physician of nearly six thousand years ago, who combined with his duties of physician those of being the Pharaoh's chief Lector Priest, Architect, and Grand Vizier.—*Science News Letter*, August 29, 1936

\*Editorial Note: Reports from the press under date of September 8 are that Lord Moynihan died on September 7.

## THE SPRINGFIELD ACADEMY OF MEDICINE

To furnish postgraduate instruction in the various branches of Medicine



Meetings second Tuesday evening of each month Professional Building 20 Maple Street, Springfield Massachusetts

The first meeting of the Academy for the year will be held on Tuesday evening September 15 at 8 o'clock

In the presence of the families friends members of the Academy and their guests the Medical Professions Committee for the Observance of the Tercentenary of Springfield will present to the Academy on this occasion a series of six panels done in oil by Miss Harriet Ellis depicting the Doctor from 1636 to 1936

These panels will be presented as a lasting memorial to a group of twenty seven colleagues of bygone days who served Springfield during their lifetimes in a particularly distinguished and outstanding manner

Dr George L Schadt Chairman will read for the Committee a short paper entitled 'Rewards of Service'

The officers of the Academy hope that each member will feel it not alone a duty but a pleasure to join in the exercises of this occasion

#### PLEASE NOTE CHANGE OF DATE

The regular scientific meeting of the Springfield Academy of Medicine will be held on Tuesday evening September 22 at 8 30 p m This meeting will take the place of the meeting which would ordinarily have been held on September 8

Dr Vilrav Papin Blair Professor of Clinical Surgery at Washington University School of Medicine St Louis Missouri will be the guest of the evening He will read a paper entitled 'Injuries of the Bones and Soft Tissues of the Face' illustrated with lantern slides

Discussion will be opened by Dr Allen G Rice and Dr Harold H Cleaveland (DDS) General discussion will follow

Luncheon will be served after the meeting

JAMES A. SEAMAN, Secretary

#### OFFICERS AND COMMITTEES FOR 1936 1937

President—Willard B Segur

First Vice-President—Michael W Harrington

Second Vice-President—Arthur J Horrigan

Secretary—James A. Seaman

Assistant Secretary—Jerome A. Whitnev

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Legislative Committee—W A R. Chapin Chairman A M Glickman R R Meunier L E Hathaway Jr

Library Committee — F S Hopkins Chairman, J A. Whitnev G DeN Hough, J A Seaman, J L Smead B Rabinovltz

September 3 1936

Editor *New England Journal of Medicine*,

It occurred to me that possibly you might be interested with reference to the data about the Springfield Academy of Medicine

As you will note the Medical Professions Committee for the Observance of the Tercentenary of Springfield will on the evening of Tuesday, September 15 present to the Springfield Academy of Medicine the series of six panels done in oil by Miss Harriet Ellis depicting the development of the Doctor from 1636 to 1936 in Springfield and shown as part of the Hampden District Medical Society's Historical Exhibit at the annual meeting in June These panels will be presented to the Academy as a permanent memorial to a group of twenty seven Doctors of bygone days who practiced in Springfield and served their City in an outstandingly constructive manner

The panels are given by the families friends hospital staffs and medical societies, and will hang in the main meeting room of the Academy at 20 Maple Street A bronze plaque 24 x 18 inches upon which will appear the name of each of the twenty seven doctors is being made Possibly you might like this list and it is given herewith You will notice that one woman Doctor is included namely Dr Phebe A Sprague, who was probably the first woman Doctor to practice in Springfield certainly one of the very earliest This list includes family Doctors of the old school modern Internists General Surgeons Specialists in Eye, Ear Nose and Throat Neurologists and Dermatologists and Obstetrician and a Bacteriologist and Pathologist the latter establishing in Springfield in 1898 one of the earliest clinical Laboratories in this Country

The program herewith will give you the other details of the meeting It is purposed to hold a complimentary dinner for our guests before the meeting In behalf of the Committee and as its Chairman may I tell you that all will be welcome who find it convenient and possible to attend.

Cordially yours

GEORGE L. SCHADT M.D.

44 Chestnut Street  
Springfield Mass

#### LIST OF NAMES ON BRONZE PLAQUE

Dr Everett A Bates  
Dr Theodore F Breck  
Dr W Wallace Broga  
Dr Daniel J Brown  
Dr Marshall Calkins  
Dr Dudley Carleton  
Dr John H. Carmichael  
Dr Frederick W Chapin  
Dr Arthur M Clapp  
Dr David Clark

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Treasury Department—U S Public Health Service

## POLIOMYELITIS

The outbreak of poliomyelitis that began in Alabama during the early part of July has apparently been confined to that State and adjoining States in the East South Central region. For the four weeks ended August 8 Alabama reported 129 cases, Tennessee 99, Mississippi 32, and Kentucky, 11—more than one half of the total cases occurred in those four States. No other State or region reported more than the usual increase that is expected at this season of the year.

The total number of cases reported for the country as a whole was 515, which was about 35 per cent of that reported for the corresponding period of 1935. In that year an epidemic that started in North Carolina reached its peak in the South Atlantic region during this period and had spread into states along the North Atlantic seaboard.

The summer rise of poliomyelitis in recent years reached its peak about the third week in September. This year each region reported the usual increase in this period over the preceding period but the figures compare favorably with those for this season in previous years when an epidemic was not in progress.—*Report of the U S Public Health Service*, August 28, 1936.

TRUANTS FROM MEDICINE FOUND FAME  
ELSEWHERE

The gifts of medicine to humanity—conquests of diseases, relief of suffering and prolongation of life—have never been minimized. Yet from early times there have been medical men who, turning aside

from their profession have made outstanding contributions in other than medical fields.

A roster of these medical "truants" was called by Lord Moynihan\* of Leeds in the latest Linsacre Lecture at Cambridge University given in memory of one of the earliest and most distinguished of the truants from medicine. In this lecture, now available in book form (Truants Cambridge University Press), Lord Moynihan refers to some hundred men, trained as physicians, who won distinction as writers, artists, scientists, statesmen, explorers, actors and even athletes.

Among the latter, Lord Moynihan lists the great cricketer, W G Grace, Lennard Stokes, outstanding Rugby player and the lawn tennis player, Joshua Pim, who won four championships.

Most persons will recall that Clemenceau deserted medical practice for politics; that Keats and Goldsmith studied medicine; that Oliver Wendell Holmes carried on simultaneously in medicine and literature, winning fame not only as the author of the Breakfast Table series but also as the first person to point out that puerperal or childbed fever is contagious.

The name of Sir Francis Seymour Haden is well known in the art world but perhaps less well known is the fact that this eminent etcher carried on a large and important medical practice, often making professional rounds with an etching plate in his pocket.

Sherlock Holmes' owed his methods of solving a mystery to the fact that his creator, Conan Doyle, studied medicine under Joseph Bell, a Scottish surgeon who impressed on all his pupils the 'endless significance of trifles and of small distinctions'."

JOHN BULL

The name of John Arbuthnot, physician and wit of the early 18th century, may not be familiar to many 20th century readers, but who does not know John Bull? This famous character and name was probably created when Arbuthnot published *Law in a Bottomless Pit, or the History of John Bull*, Lord Moynihan states.

A physician of the 16th century, William Gilbert gave the word electricity to the English language, while important additions to knowledge of electricity were made by an Italian physician, Galvani. Copernicus the founder of modern astronomy, Linnaeus, father of modern scientific botany, Galileo, Robert Boyle—all held medical degrees and are ranked with the other 'truants' by Lord Moynihan.

Honor of being the first truant goes to Imhotep, the Egyptian physician of nearly six thousand years ago, who combined with his duties of physician those of being the Pharaoh's chief lector, Priest, Architect, and Grand Vizier.—*Science News Letter*, August 29, 1936.

\*Editorial Note: Reports from the press under date of September 8 are that Lord Moynihan died on September 7.

## THE SPRINGFIELD ACADEMY OF MEDICINE

To furnish postgraduate instruction in the various branches of Medicine.

being demonstrated. These lamps were specially constructed for the exhibit and are only 4 volts each. Thus while the figure is amply lighted for demonstration it will not become overheated. The lamps in the interior of the figure are shaped according to the contour of each organ. As each is illuminated its name is automatically flashed on a glass label on the side of the base. These are in duplicate for the convenience of onlookers.

During its demonstration the brain from which the skull cap is removed is first illuminated, then the larynx, thyroid gland, lungs, heart, etc. follow in turn. At the close the whole figure stands forth in natural colors fully illuminated from the base. The exhibit, which is ingenious in more ways than one, may also be demonstrated manually so that the doctor demonstrating it may light up any organ or any number of organs at the same time. The figure operates on its own motor.

In constructing The Camp Transparent Woman a series of photographs were first made of normal organs. The negatives of these photographs were then projected on a screen and from their giant enlargement a series of drawings were made by the artists co-operating in the figure's construction.

These drawings are the basis of the sculptor's work in making the moulds for the various parts. During this phase of the exhibit's construction the most detailed supervision was maintained by the medical authorities in the museum so that each organ and artery is scientifically accurate in color, size and dimension. After the various sections had been fabricated from cellhorn a model of the entire figure was made.

The model is actually a life-size figure in plaster of Paris based on the scientific measurements of the skeleton bones and major organs. From this model the complete cellhorn skin silhouette was moulded.

The Camp Transparent Woman will recall the Transparent Man to the scientific world of America. The first Transparent Man was brought from the same source by Drs. Carl and Robert Mayo of the Mayo Clinic, Rochester, Minn., where it is now on permanent exhibition. It aroused the widespread interest of the medical and scientific worlds when temporarily displayed in The Hall of Science at The Century of Progress Exposition, Chicago. The educational authorities of that city arranged for three hundred thousand school children to see the Transparent Man during the last month of its exhibition there.

Only three other Transparent Men have been constructed. One is in the Hall of Man at The Buffalo Museum of Science. Another was secured for the Swedish Red Cross Museum in Stockholm. The third is in the Hygiene Museum in Dresden.

The Camp Transparent Woman, however, is the only one in existence.

To scientists and the medical world The Camp Transparent Woman represents a triumph in the history of anatomical study throughout the world.

Among those present at the preview were John L. Rice, M.D., Commissioner of Health, City of New York; Eben J. Carey, D.Sc., M.D., Dean, School of Medicine, Marquette University, Milwaukee, Wis.; Paul B. Brooks, M.D., Deputy Commissioner, New York, State Department of Health, Albany, N. Y.; Burt R. Rickards, S.B., Director of Public Health Education, State Department of Health, Albany, N. Y.; J. Lynn Mahaffey, M.D., Director, New Jersey State Department of Health, Trenton, N. J.; William K. Gregory, M.D., Curator of Comparative Anatomy, American Museum of Natural History, New York; Hans Christian Adamson, Assistant to the President, American Museum of Natural History, New York; Mr. William Faunce, Vice-Director, American Museum of Natural History, New York; Louis I. Dublin, Vice-President, Metropolitan Life Insurance Company, New York; Donald B. Armstrong, M.D., Vice-President, Metropolitan Life Insurance Company, New York; Cary Eggleston, M.D., Willis W. Lasher, M.D., F.A.C.S., Mr. Thomas C. Edwards, Executive Officer, National Health Council, New York; Dr. Alexander Lesser, Department of Anthropology, Columbia University; William F. Snow, M.D., General Director, American Social Hygiene Association; Kendall Emerson, M.D., Managing Director, National Tuberculosis Association; Reginald Atwater, M.D., Executive Secretary, American Public Health Association; Samuel Gitlow, M.D., Frank Kiernan, Director, New York Tuberculosis and Health Association; Charles S. Prest, M.D., Secretary, Brooklyn Tuberculosis and Health Association; Homer Wickenden, General Director, Eleanor Conover, M.D., Director of Hospital Information; Maxwell Hahn, Director of Public Education, United Hospital Fund of New York; W. M. Brien, M.D., Health Officer, Orange, N. J.; F. K. Benton, M.D., Medical Director, Western Union Company, and many others. — *Excerpts from the Statements of Laurence Fertig & Company, Inc.*

## CORRESPONDENCE

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

535 North Dearborn Street, Chicago, Illinois

September 1, 1936

Managing Editor

*The New England Journal of Medicine,*

In addition to the articles enumerated in our letter of August 4 the following have been accepted:

Jensen Salsbery Laboratories, Inc.

Botulinus Antitoxin (Human) (containing 2500 units each of Type A and Type B Antitoxin)

Sharp & Dohme, Inc.

Grass Mixture Pollen Extract (Timothy, June, Orchard Sweet Vernal and Rep. Top Grass Pollens) and Grass Mixture Pollen Extracts (Pollens of Southwestern Grasses)

Dr Luke Corcoran  
 Dr Herbert C Emerson  
 Dr Joseph T Herrick  
 Dr Charles P Hooker  
 Dr Daniel E Keefe  
 Dr Philip Kilroy  
 Dr Sanford Lawton  
 Dr Edward J Mahoney  
 Dr Alexander S McClean  
 Dr George C McClean  
 Dr John Morgan  
 Dr William H Pomeroy  
 Dr Louis A Préfontaine  
 Dr George Rhoads  
 Dr Walter A Smith  
 Dr Phebe A Sprague  
 Dr George D Weston

### THE CAMP TRANSPARENT WOMAN

The Camp Transparent Woman was unveiled in New York August 20, 1936 in the private preview room of The New York Museum of Science and Industry in Rockefeller Center by Dr Dean De Witt Lewis famous Surgeon-in-Chief of Johns Hopkins Hospital, Baltimore Md before a distinguished gathering of noted scientists leading medical authorities and prominent public health officials

Dr Roy Chapman Andrews Director American Museum of Natural History, New York was also a speaker on this program which was nationally broadcast.

The exhibit was brought to America, and is lent to the museum through the generosity of S H Camp, widely known manufacturer of physiological supports of Jackson, Mich, as his contribution to public health education in America.

The figure is constructed entirely of a transparent material making every organ, even the delicately designated veins and circulatory system clearly visible to the observer as though he were possessed of x-ray eyes. It is now on public exhibition in the Main Hall of The New York Museum of Science and Industry for a brief period prior to a nationwide public health educational tour of 100 cities which is expected to last more than two years. It will be accompanied by a doctor-lecturer who will introduce the exhibit to scientists, the professional and public health officials nationally, and to the general public in a series of lectures to which admission will be free.

Mr Camp will donate the transparent figure to some prominent medical school or museum for permanent exhibition at the close of its educational tour during which it is expected to be viewed by several million women.

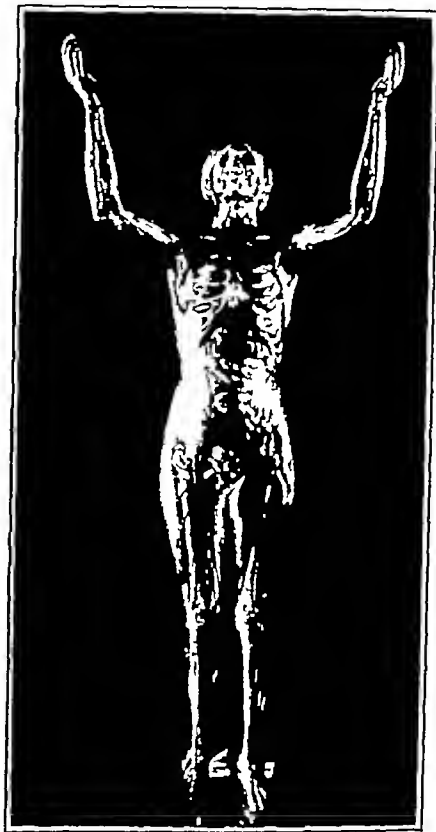
The Camp Transparent Woman is the first and only one in the world. Its unveiling and preview in The New York Museum of Science and Industry was the first time it had been exhibited anywhere.

Celiphorn the substance of which the figure is built was developed by secret process. It is important in that an exhibit of this kind, to be success-

ful, must be impervious to the normal dangers of changing temperature and travel.

Previous attempts made with a 'wax' figure were unsuccessful because temperature changes caused the figure to lose its perfect proportions.

The Camp Transparent Woman however, was not



brought to America to teach the details of anatomy. Rather it is a unique and dramatic public health educational exhibit through which the intricate structure and perfectly functioning mechanism of the female body may be seen as a whole for the first time in human knowledge.

It is the result of twenty years of laboratory research and was achieved through the combined efforts of the wood carvers, electricians, laboratory workers, artists, sculptors, medical authorities and scientists of the Hygiene Museum in Dresden. Actually the present figure took nearly two years in its construction.

The Camp Transparent Woman is exhibited in a heroic pose, arms outstretched above the head. Ethnologically it might be described as a universal Caucasian type of approximately 30 years of age.

The figure stands on a gleaming round silver mounting in the center of the opaque glass-covered interior of an octagonal walnut wood base. Inside the glass interior are 121 lamps which light up the figure indirectly after each demonstration. Inside the figure itself are 20 sets of two lamps each which light up each organ in sequence while the exhibit is

# CORRECTION

The address of Dr Robert J Joplin which appeared in This Week's Issue (New Eng J Med 215 303 [Aug 13] 1936) was incorrectly given. It should have read 372 Marlboro Street Boston Mass

# REMOVALS

BERNARD I GOLDBERG M.D., announces the removal of his office to 481 Beacon Street, Boston.

WILLIAM E LADD M.D., announces the removal of his office to The Children's Hospital, 300 Longwood Avenue Boston Third Floor, The Bader Building Telephone Aspinwall 5930

# SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK  
BEGINNING MONDAY, SEPTEMBER 14, 1936

Wednesday September 16—

11 a m Clinico-Pathological Conference Children's Hospital

Saturday, September 19—

\*10 a m - 12 m Staff Rounds at the Peter Bent Brigham Hospital Conducted by Dr Henry A Christian

\*Open to the medical profession

†Open to Fellows of the Massachusetts Medical Society

September 10 June 24—Pentucket Association of Physicians See page 474 Issue of September 3

September 14 and 15—Tercentenary Session of the Harvard Medical School See page 1166 Issue of June 4 and page 473 Issue of September 3

September 16 21—First International Congress of Sanatoria and Private Nursing Homes See page 803 Issue of April 16 and page 264 Issue of August 6

September 22, 23 24—Twelfth Clinical Congress of the Connecticut State Medical Society See page 217 Issue of July 30

October 4 17—Medico-Military Inactive Duty Training Mayo Foundation See page 612

October 12 18—Third International Congress on Malaria See page 1076 Issue of May 21

October 19 23—Clinical Congress of the American College of Surgeons See page 180 Issue of January 23

October 19 31—1936 Graduate Fortnight of the New York Academy of Medicine See page 1221 Issue of June 11

October 20 22—Academy of Physical Medicine Annual Meeting Hotel Statler Boston

October 20 23—The American Public Health Association See page 1226 Issue of June 11

December 3 5—Annual Conference of the National Society for the Prevention of Blindness Columbus Ohio

March 30 April 2 1937—First International Conference on Feter Therapy Postponement notice See page 52 Issue of July 2

April 21 24 1937—American Society for Experimental Pathology See page 1075 Issue of May 21

# DISTRICT MEDICAL SOCIETIES

## FRANKLIN DISTRICT MEDICAL SOCIETY

Will meet at the Weldon in Greenfield at 11 a. m. the second Tuesdays of November January March and May

CHARLES MOLINE M.D. Secretary

## MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

October 7—Bear Hill Golf Club Stoneham

November 18—Bear Hill Golf Club Stoneham

January 13 1937—Bear Hill Golf Club Stoneham

March 16 1937—Danvers State Hospital Danvers

May 11 1937—Bear Hill Golf Club Stoneham

KENNETH L MACLACHLAN M.D. Secretary  
1 Bellevue Avenue Melrose

## PLYMOUTH DISTRICT MEDICAL SOCIETY

October 15—11 a. m. at the Moore Hospital Brockton  
FRED F WEINER M.D. Secretary  
231 Main Street Brockton

# WORCESTER DISTRICT MEDICAL SOCIETY

September 23—At the Milford Hospital Milford Mass 4 30 p m Visitation of the Milford Hospital unit which has been recently refinished and added to 6 15 p m Dinner—complimentary by the hospital 7 30 p m Scientific program and business session The speakers for this meeting will be Dr Richard Miller and Dr Cadis Phipps of Boston who will give a symposium on Peptic Ulcer with Dr Miller discussing the surgical aspects and Dr Phipps the medical aspects of this condition

October 14—Rutland State Sanatorium Rutland Mass 6 16 p m Dinner—complimentary by the State Hospital 7 30 p m Business session and scientific program Speakers and subjects to be announced in a later issue of the Journal

November 5—At 4 30 in the rooms of the Worcester Medical Library Inc at 34 Elm Street Worcester will be held the fall Censors meeting

November 11—Grafton State Hospital North Grafton Mass 6 15 p m Dinner—complimentary by the hospital. 7 30 p m Business session and scientific program

December 9—St Vincent Hospital Worcester Mass 6 16 p m Dinner—complimentary by the hospital 7 30 p m Business session and scientific program

January 13, 1937—Worcester City Hospital Worcester Mass 6 16 p m Dinner—complimentary by the hospital 7 30 p m Business session and scientific program

February 10, 1937—Worcester State Hospital Worcester Mass 6 15 p m Dinner—complimentary by the hospital 7 30 p m Business session and scientific program

March 10 1937—The Memorial Hospital Worcester Mass 6 15 p m Dinner—complimentary by the hospital. 7 30 p m Business session and scientific program

April 14 1937—Worcester Hahnemann Hospital Worcester Mass 6 16 p m Dinner—complimentary by the hospital 7 30 p m Business session and scientific program

May 6 1937—At 4 30 in the rooms of the Worcester Medical Library Inc at 34 Elm Street Worcester, will be held the spring meeting of the Board of Censors

Wednesday Afternoon and Evening May 12, 1937—Annual Meeting Time and place for this meeting will be announced in an early spring issue of the Journal

ERWIN C MILLER M.D. Secretary

27 Elm Street Worcester

# BOOKS RECEIVED FOR REVIEW

Cystoscopy and Urography Jas B Macalpine. Second Edition 478 pp Baltimore William Wood & Company \$9 00

Williams Obstetrics Henricus J Stander Seventh Edition 1269 pp New York and London D Appleton Century Company \$10 00

A Manual of Practical Obstetrics O Donel Browne 363 pp Baltimore William Wood & Company \$6 50

Physician, Pastor and Patient. George W Jacoby 390 pp New York and London Paul B Hoeber, Inc \$3 50

Symptoms and Signs in Clinical Medicine E Noble Chamberlain With a Chapter on The Examination of Sick Children by Norman B Capon 424 pp Baltimore William Wood & Company \$8 00

Maladies de la Nutrition F Rathery 173 pp Paris Masson et Cie Editeurs 22 fr

Facts About Commercially Canned Foods 34 pp New York American Can Company

Theory and Practice of Psychiatry William S Sadler 1231 pp St. Louis The C V Mosby Company \$10 00

Surgical Diseases and Injuries of the Genito Urinary Organs Sir John Thomson Walker Second Edition Edited by Kenneth Walker 974 pp Baltimore William Wood & Company \$10 00

The Thyroid E P Sloan 476 pp Springfield and Baltimore Charles C Thomas \$10 00

Antipneumococcic Serum Types I and II Combined  
Nonproprietary Articles  
Tetrachlorethylene  
Yours truly,  
PAUL NICHOLAS LEECH, *Secretary*,  
Council on Pharmacy and Chemistry

## RECENT DEATHS

**TUHOLOSKI**—DAVID BENJAMIN TUHOLOSKI, M D, of 34 Woodside Avenue, Brockton Massachusetts, died August 31 1936

Dr Tuholski was born in Erie Pa in 1880 graduated from the Pennsylvania State College in 1903 and from the University of Pennsylvania School of Medicine in 1907 He took postgraduate courses in his Medical Alma Mater and was awarded a degree of Bachelor of Science for research work in biology

After serving in the Howard Hospital in Philadelphia for two years he moved to Brockton in 1909 He served as health officer in 1924 and 1925 and again from 1932 until the time of his death

As president of the Brockton Tuberculosis Association and a past president of the Plymouth County Medical Society, he was prominent in medical affairs in that district Dr Tuholski was a Fellow of the Massachusetts Medical Society and the American Medical Association

In 1913 he married Mildred Burnette Chase His widow and a son David B Tuholski survive him

**HAYES**—JUSTIN GIBSON HAYES, M D, of Williamsburg, Mass, died in the Cooley Dickinson Hospital, Northampton, Mass on June 18, 1936 after a long illness Dr Hayes was born in Farmington, New Hampshire, in 1849, and graduated from Dartmouth College in 1873 and the University of New York Medical School in 1881 He was a fellow of the Massachusetts Medical Society and had practiced in Williamsburg, Mass, for the past forty four years He is survived by one son, Justin E Hayes M D, of Northampton, Mass

## NOTICES

### UNITED STATES CIVIL SERVICE EXAMINATIONS

Medical Officer, \$3 800 a Year  
Associate Medical Officer, \$3 200 a Year  
Assistant Medical Officer, \$2,600 a Year

Applications must be on file with the United States Civil Service Commission at Washington, D C, not later than September 15 1936

The paragraph on Education, which appears in original announcement 91, is amended to read as follows

'Education—Except for the substitution provided below, they must have been graduated from a medi-

cal school of recognized standing with the degree of M D For the associate and assistant grades such graduation must have been not more than 4 years and for the full grade not more than 20 years prior to the date of making oath to the application, provided that where an applicant for the full grade was graduated more than 20 years prior to such date, but during the 20 year period has pursued a postgraduate course of systematic institutional work amounting to not less than 1 school year of 9 months in the particular optional branch for which he applies, his application will be accepted'

The closing date for receipt of applications has been changed to September 15, 1936

### MEDICO MILITARY INACTIVE DUTY TRAINING MAYO FOUNDATION

Omaha, Nebraska

August 12, 1936

#### To Medical Department Reserve Officers

1 The eighth annual training course for Medical Department Reservists of the Army and Navy will be held at the Mayo Foundation, Rochester, Minnesota from October 4 to 17, 1936

2 This training course was first inaugurated by the Seventh Corps Area at the request of the Mayo Foundation to give training in military medicine to the younger medical men connected with the Foundation Other reserve officers requested permission to enroll and to take advantage of the opportunity to attend clinical presentations during the morning hours Such permission was granted and such attendance has become so increasingly popular that it is now necessary to limit the enrollment

3 The program will follow the plan of the past years The morning hours will be devoted entirely to professional work in special clinics and study groups Officers in attendance may select the course they wish to follow from the wide variety of presentations offered The afternoons and evenings will be devoted to a medico-military program under the direction of the Surgeon of the Seventh Corps Area (Army) and the Surgeon of the Ninth Naval District (Navy)

4 This training is on an inactive duty status and is without expense to the Government Enrollment is open to all Army and Navy reservists of the Medical Departments in good standing Application should be submitted to the Surgeon of the Seventh Corps Area Omaha, Nebraska or the Surgeon Ninth Naval District, Great Lakes Illinois Enrollment is limited to two hundred

5 The Surgeons General of the Army Navy and Public Health Service have signified their desire to attend at least a portion of the course

Headquarters Seventh Corps Area  
Office of the Surgeon  
Surg 353 OR (Mayo Foundation) JRH 4000

KENT NELSON Colonel,  
Medical Corps Surgeon

**The Normal Diet and Healthful Living** W D Sansum, R. A Hare, and Ruth Bowden 243 pp New York The Macmillan Company \$2 00

A revision of the 'Normal Diet' written by Dr Sansum a few years ago this book contains besides many points on healthful living and is a welcome addition to the literature on nutrition. This is especially so, since the joint authors discuss freely, frankly, and from a modern point of view, some of the common disorders of the body. The explanation and discussion of the subjects at the end of the book are especially illuminating. As an example in a chapter on the 'Elimination of Wastes,' constipation is considered from the standpoint of the form of the feces and the intestinal rate. Then in one on 'A Survey of Methods of Treatment' the following sentence serves to illustrate the progressive point of view. The future holds more promise of progress by teaching and informing men so that they can care for themselves than by centering our (physicians') attention on restoring health when it has been lost. Perhaps an ultraprogressive standpoint is taken in the one on 'Indigestion,' since the juices of the fruits containing citric acid are recommended for a reduced acidity of the gastric contents when the exact acid in the form of dilute hydrochloric acid is so readily administered. The subjects treated in the beginning of the book are similar to many others inasmuch as the components and the digestion and absorption of food are described. Then in the appendix, some tables menus and articles for suggested reading are listed. Besides being of use to lay readers, for whom it was especially intended the book should be of interest also to dietitians and physicians.

**Collected Papers of The Mayo Clinic and The Mayo Foundation** Volume 27 Edited by Richard M Hewitt Lloyd G Potter and A. B Newling 1353 pp Philadelphia and London W B Saunders Company \$12 00

The current number of the collected papers like its predecessor is designed in such a way that it will be particularly attractive to the general practitioner. This purpose is accomplished by printing in full those articles that have clinical value of wide usefulness and from the remaining merely giving abstracts and titles.

One need only peruse this volume to see what an immense clinical laboratory is contained in the Mayo Clinic and how effectively it is used to evolve principles in diagnosis and treatment. As one penetrates beyond the surface one finds an excellent work by the editors in composing a broad review of recent advances in medicine. Far from being encyclopedic the volume gives such delightful gems as a discussion of history in thyroid surgery by Pemberton reminiscences in a similar vein by C H Mayo and a most readable discussion of splenomegaly by the Mayo brothers. Then there are statistical studies descriptions of surgical procedure

notes on experimental work and occasional academic classifications. All of these papers have been printed elsewhere and no bibliography is included but reference is made to the original article in each case.

If one buys only a few medical books each year certainly this one would be most valuable in keeping one's library up to date with pleasingly readable material.

**The Study of Anatomy** Written for the Medical Student. S E Whitnall Third Edition 113 pp Baltimore William Wood & Company \$1 75

This is the third edition of a small but very remarkable and unusual book first published in 1933 whose earlier editions had not come to the attention of this reviewer. It is addressed to medical students and is a human and humane document of one who, devoting his life to the teaching of anatomy at Oxford at Montreal and at Bristol has regarded his subject not from the limited standpoint of pure science or of clinical application but as an element in its relation to the many other elements which make up the multiform total of life knowledge and spiritual perception. Perhaps no one else except Oliver Wendell Holmes has ever written about anatomy from just this point of view, a point of view like that from which Sir William Osler Sir Thomas Browne and a few others have written about medicine. The author has obviously a rich background of general culture including not only the sciences the fine arts the classics literature and history but those departments of social understanding which are embraced under the classification of the humanities. Naturally, this monograph is not intended to teach anatomy but to suggest to students how anatomy should be studied. It is a stimulative and inspiring work and one wishes that it might be read marked and inwardly digested not only by all students but by all teachers of human anatomy for their mutual benefit. Above all it reveals the author as that essentially rare individual a true scientist who is at the same time a true humanist.

**Passive Vascular Exercises and the Conservative Management of Obliterative Arterial Diseases of the Extremities** Louis G Herrmann 288 pp Philadelphia and London J B Lippincott Company

This volume covers the subject of peripheral vascular disorders quite well giving other accepted forms of treatment as well as the Pavax idea although the title might lead one to believe that the book is confined to that phase of the subject.

Herrmann and Reid deserve a tremendous amount of credit for their interest in this problem and the final development of a satisfactory mechanical device for the more rapid development of collateral circulation in arterial disease of the extremities. In addition to this new piece of apparatus which is



**An Index of Treatment.** By various writers Edited by Robert Hutchison Eleventh Edition 1020 pp Baltimore William Wood & Company \$12.00

**The Anaemias** Jauet M. Vaughan With Notes on Normal and Pathological Erythropoiesis by Herbert M. Turnbull Second Edition 309 pp London Oxford University Press \$4.50

**Applied Physiology** Samson Wright. Sixth Edition 686 pp New York Oxford University Press \$6.00

## BOOK REVIEWS

**Studies from The Rockefeller Institute for Medical Research** Reprints Volume 96 637 pp New York The Rockefeller Institute for Medical Research

One of the most interesting reports presented in this volume is that by Rous and Beard, dealing with the progression to carcinoma of virus induced rabbit papillomas, the Shope virus being used. Of interest also in the study of virus diseases is the report of Rivers and Ward on smallpox vaccination by means of intradermal injections of vaccine virus grown in minced chick embryo tissue and Tyrode's solution.

From the department of the hospital are presented a series of studies by Van Slyke and his collaborators on the renal excretion of various substances.

The studies on sprue by Rhoads and his collaborators are continued.

Of marked scientific interest are further studies by Stanley on the nature of the virus of tobacco mosaic.

**Researches Published from the Wards and Laboratories of the London Hospital During 1935** London H. K. Lewis & Co. Ltd 7s 6d

These collected reprints from the London Hospital uphold the standard set by previous issues of a similar nature and illustrate the fine type of work being done at this ancient institution. A wide variety of subjects is thus brought to the attention of the readers of this volume and an estimation of the progress in medicine in one of the great hospitals of the world can be obtained. Space is not available to give a detailed list of all the timely subjects here set forth. Particular attention, however, should be called to the work carried on at the London Hospital on human psittacosis, clinical and pathological studies on pituitary tumors and their secretions, occupational argyria, internal hydrocephalus in spina bifida, and the treatment of saccular aneurysm of the thoracic aorta.

**The Patient and the Weather** Volume I Part 2 William F. Petersen and Margaret E. Miliken 781 pp Ann Arbor Edwards Brothers, Inc \$9.00

The first section of this volume was reviewed in the *Journal* for June 18, 1936. Part 1, which was largely introductory, outlined the main thesis. The

author is attempting to correlate weather conditions with human pathology. Thus a broad point of view is assumed. The present volume, Part 2, deals largely with the correlation between the atmospheric environment and normal individuals. The reactions of four young men, students, have been very completely analyzed in this large volume. The author goes into great detail in regard to all the usual laboratory tests found in a modern hospital. All four individuals were essentially normal but there were phases in their metabolism and chemistry which apparently coincided with certain general trends in the weather. The author, therefore, speaks of the human organism as a 'cosmic resonator'. The book is filled with charts and diagrams and references to the literature are placed at the end of each chapter. The whole project is monumental and most difficult to evaluate. In previous volumes the author's style was so obscure that it was often impossible to grasp his meaning. In this he has greatly improved and we are now at least able to understand in large part what forms the basis of his labors. He believes, moreover, that many of the facts which he now presents in a modern scientific manner were already known and accepted by the Greek physicians of Hippocrates' time. He contends, therefore, that bacteriology has drawn us away from the more general observations particularly in relation to disease conditions and the environment. All biological reactions change with the weather. Perhaps this is illustrated best by observations on the blood pressure and much of the material in this volume relates to such data. The volume therefore will be of great interest to physiologists as well as clinicians. With a distinct improvement in style the author should have a larger and more appreciative audience.

**Syphilis and Its Treatment.** William A. Hinton 321 pp New York The Macmillan Company \$3.50

This book very satisfactorily fills a real need for our ideas in regard to syphilis have gone through some changes in the last few years and considerable crystallization and the only books containing these new ideas are most excellent but clearly written primarily for the specialist. Hinton has carefully avoided controversial matters and has simplified the whole problem so that it really fits the group for which it is intended i.e. the student, the general practitioner, and the social worker. Technical terms have been omitted as far as possible without sacrifice of clarity.

The author's training as a pathologist has led him to question some of the traditions of syphilis and to re-express them so as to fit the known underlying pathology.

The reviewer cannot resist the temptation to pay a tribute to the modesty of the author as shown in his delicate handling of the marked advantages of the test of which the author is the originator and which bears his name.

The book is highly recommended to be owned and read by all who treat syphilis.

# The New England Journal of Medicine

VOLUME 215

SEPTEMBER 17, 1936

NUMBER 12

## THE PRINCIPLES OF THERAPY IN PATIENTS WITH CONGESTIVE HEART FAILURE\*

BY TINSLEY R. HARRISON, M.D.†

IN an address delivered before the Massachusetts Medical Society on May 30, 1860 Oliver Wendell Holmes made certain remarks which may be appropriately quoted in any discussion of the treatment of disease.

"A medical man, as he goes about his daily business after twenty years of practice, is apt to suppose that he treats his patients according to the teachings of his experience.

But it is easy to prove that the prescriptions of even wise physicians are very commonly founded on something quite different from experience. Experience must be based on the permanent facts of nature. But a glance at the prevalent modes of treatment of any two successive generations will show that there is a changeable as well as a permanent element in the art of healing, not merely changeable as diseases vary, or as new remedies are introduced, but changeable by the going out of fashion of special remedies, by the decadence of a popular theory from which their fitness was deduced, or other cause not more significant. There is no reason to suppose that the present time is essentially different in this respect from any other. Much, therefore, which is now very commonly considered to be the result of experience, will be recognized in the next, or in some succeeding generation, as no such result at all, but as a foregone conclusion, based on some prevalent belief or fashion of the time."

Parenthetically, we may note that we do not have to travel far in order to find an excellent illustration of the truth of Holmes' statement. Digitalis has been successfully used for many years in the treatment of congestive heart failure. Following the development of instrumental methods for the study of the heartbeat it became apparent that the chief action of the drug, *when studied by these methods*, was in cases of auricular fibrillation. Accordingly, one school of clinicians taught that the drug's only value was in such cases, and this belief is still widely prevalent in Great Britain and to a lesser extent in the United States. The theory of that time which further experimentation has

shown to have been incomplete, demanded that the drug *should* be useful in only such cases, and, accordingly, many physicians were willing to discount the results of daily experience, which pointed toward its value in many cases with regular rhythm as well and omitted to give digitalis to many persons who needed it. Fortunately—and for this Dr. Christian more than anyone else deserves the credit—we have learned what our grandfathers knew, that digitalis is useful in almost all cases of chronic congestive heart failure, regardless of the rhythm.

To return to Oliver Wendell Holmes: "There are, of course in every calling, those who go about the work of the day before them doing it according to the rules of their craft, and asking no questions of the past or of the future, or of the aim and end to which their special labor is contributing. These often consider and call themselves *practical men*. They pull the oars of society and have no leisure to watch the currents running thus or that way, let theorists and philosophers attend to them. In the meantime however these currents are carrying the practical men, too, and all their work may be thrown away and worse than thrown away, if they do not take knowledge of them and get out of the wrong ones and into the right ones as soon as they may. Sir Edward Parry and his party were going straight towards the pole, in one of their arctic expeditions, travelling at the rate of ten miles a day. But the ice over which they travelled was drifting straight towards the equator, at the rate of twelve miles a day, and yet no man among them would have known that he was travelling two miles a day backward, unless he had lifted his eyes from the tract in which he was plodding.

"Presumption is of vast importance in medicine as in law. A man is presumed innocent until he is proved guilty."

The presumption always is that every noxious agent including medicines proper which may hurt a well man may also hurt a sick one.

Throw out opium which the Creator himself seems to prescribe for we often see the scarlet poppy growing in the cornfields as if it were foreseen that wherever there is hunger to be fed

The Henry Jackson Lecture delivered before the New England Heart Association April 30, 1936.

†Harrison, Tinsley R.—For record and address of author see This Week's Issue, page 56.

particularly valuable in acute occlusions such as peripheral embolus and frostbite these workers have contributed other outstanding work in this field all of which is contained in this volume

A very interesting historical account of the development of negative and positive pressure on the extremity is well presented

**Diagnostic Roentgenology** Edited by Ross Golden 867 pp New York and Edinburgh Thomas Nelson & Sons

This volume is made up of a series of contributions on roentgen diagnosis as follows

- (1) The Roentgen Ray Diagnosis of Disease of the Skull and Intracranial Contents Cornelius G Dyke
- (2) The Roentgen Ray Examination of the Paranasal Sinuses and the Mastoids G W Grier
- (3) Radiology of the Chest Coleman B Rabin
- (4) Clinical Roentgenology of the Cardiovascular System Hugo Roesler
- (5) The Roentgen Ray Examination of the Digestive Tract Ross Golden
- (6) The Roentgen Ray Diagnosis of Diseases of Bones Paul C Hodges D B Phemister, and Alexander Brunswick
- (7) The Roentgen Ray Diagnosis of Spinal Cord Tumors Cornelius G Dyke
- (8) Roentgenologic Diagnosis of Diseases of the Urinary Tract Leopold Jachec and Marcy L Sussman
- (9) Uterotubography Samuel A Robins and Albert A Shapira
- (10) The Use of the Roentgen Ray in Obstetrics Howard C Moloy and Paul C Swenson
- (11) The Radiology of Fractures Edward H Skinner

The need of a volume covering the field of Roentgen Ray diagnosis has long been felt. Although a number of such publications have appeared in foreign languages there are very few written in English. The contributors are outstanding men and their material has been unusually well presented. This book should be of value not only to the specialist in Roentgenology, but also to the practitioner of general medicine

**L'Année Thérapeutique Médications et Procédés Nouveaux** A Ravina 195 pp Paris Masson et Cie 18 fr

This small book, which resembles in many respects the 'Progress' articles which appear from time to time in *The New England Journal of Medicine*, contains a résumé of what the author believes were the outstanding therapeutic contributions appearing during 1935 in French periodicals and in those from other parts of the world. The first part deals with new measures which have been tried or recommended in a varied list of diseases. Included

among these is the treatment of eczema with spleen extract, of undescended testes with profan, of enuresis with sex hormones and of potassium cyanide poisoning by means of intravenous sodium thiosulphate. The second part deals with the practical application in a number of disorders of electrocoagulation, suboccipital puncture and transfusion. The third subdivision is concerned with the consideration of the use of such definite agents as methylene blue, ergosterol, insulin, the iodides, vitamins and snake venom. There is a short but excellent chapter on the untoward reactions that may occur with gold therapy, their prevention and treatment. The book should prove of value to those interested in keeping abreast with medical progress.

**Studies from The Rockefeller Institute for Medical Research Reprints** Volume 97 621 pp New York The Rockefeller Institute for Medical Research

Among the varied subjects considered in this volume of reprints reflecting the wide activities of the research staff of the Rockefeller Institute are the studies by Sabin and her collaborators on the reaction to waxy substances from tubercle bacilli and from the leprosy bacillus.

Of interest to those aware of the menace to vegetation presented by the Japanese beetle is a report from the department of animal pathology by Glaser and Farrell on field experiments with the nematode parasite of the beetle.

From the department of the hospital are studies on the immunological aspects of the pneumococcus and a group of studies on the plasma lipids by Van Slyke and his associates establishing values for normal men and the effect on the values of plasma lipids of age, chronic nephritis and hypertension.

To select any one paper from the group of widely varied material for comment is difficult and the above references simply show the wide range of interesting data obtained by workers at the Institute.

**Allergy of the Nose and Paranasal Sinuses. A Monograph on the Subject of Allergy as Related to Otolaryngology** French K Hansel 820 pp St Louis The C V Mosby Company

This monograph brings into one volume the concept of allergy in its ear, nose and throat manifestations. The arrangement is orderly, progressing from the anatomy, physiology, histology and pathology of the paranasal sinuses to the more complex problems of allergy.

The author not only draws from his vast clinical experience but quotes freely from the literature. Each chapter is followed by an extensive bibliography.

This volume fulfills a long felt need and should acquaint the allergist with some of the problems of the rhinologist as well as acquaint the rhinologist with those of the allergist.

is doing more work (the term "work" as used here refers to accomplishment) its efficiency remaining constant or because its efficiency has diminished the work accomplished remaining constant. Conversely, the heart may expend less energy either as the result of a diminution in its work or an increase in its efficiency.

The work of the heart depends on three factors: the output of blood per unit of time, the average pressure against which this blood is expelled, and the velocity imparted to the blood. Under conditions of low output such as obtain at rest, the last-mentioned factor is sufficiently small to be neglected. Since none of the therapeutic measures which are ordinarily used produce constant changes in blood pressure, it is evident that their chief effect on the work of the heart must be reflected in changes in its output. Certain useful methods of treatment, such as rest, sedatives, venesection, dietary restriction, and thyroidectomy, have been shown to diminish the amount of blood pumped by the heart, and hence the work done. These therapeutic measures are therefore believed to diminish the energy expended by the heart and to rest this organ.

The mechanical efficiency of the human heart cannot be measured directly by any method which has yet been devised. However, it is known from experiments on animals that when other conditions remain the same the energy expended by the heart varies directly with its diastolic volume. It has also been shown that when the work performed is kept constant the energy expended per unit of time is greater at rapid than at slow heart rates. It is therefore evident that therapeutic procedures which either slow the heart or which diminish the size of the heart tend to decrease the energy expended. Digitalis has both of these effects. The action of this drug on the work performed by the hearts of persons with heart failure is inconstant: the output being increased in some subjects, diminished in others, and unchanged in a third group, but the size of the heart is almost always diminished and the pulse rate is usually slowed in significant degree by digitalis. The best available evidence indicates that the beneficial action obtained by this drug is to be ascribed to an increase in the efficiency of the heart which is enabled to carry on its work with a diminished expenditure of energy. The happy results of quinine in conditions of regular and irregular tachycardia are likewise to be ascribed to increased mechanical efficiency of the heart as the result of slowing in rate. Whether diuretic drugs have any action on the heart directly is still an unsettled question. There is some evidence which indicates that in certain patients diminution in edema is accompanied by a lessening of the blood flow through edematous tissues, and secondarily by a de-

crease in the work of the heart. Edema of the myocardium also sometimes occurs in patients with congestive failure, and it is perhaps not so fanciful to believe that if diuretic drugs can lessen the accumulation of fluid between the cardiac fibers, they may increase the efficiency of this organ.

The available evidence therefore indicates that procedures which produce benefit in patients with congestive heart failure do so primarily by diminishing the energy expenditure of the heart, and that this is accomplished either by decreasing the work it has to do or by increasing the efficiency of its performance.

The third principle of therapy is this: *Congestive heart failure is a vicious cycle for some of the symptoms produced by it tend to themselves to exaggerate it, and therefore rigid treatment of some of the effects of heart failure tends to help the underlying functional disorder which produces heart failure.*

This conception may be well illustrated by a consideration of the effects of cough, which is a very common symptom of congestive heart failure. Coughing is a violent muscular effort and like other exertion causes an increased metabolism of the body. During coughing there is a marked rise in the intrathoracic pressure. It is important to remember that the right ventricle is normally only about one third as thick as the left, and that the pulmonary arterial pressure is a similar fraction of the systemic pressure, hence a rise of twenty or thirty millimeters pressure in intrathoracic pressure constitutes a serious strain for the right ventricle. Coughing also raises the venous pressure, and it is known that a rise in venous pressure produces reflex stimulation of breathing and hence tends to cause dyspnea. One frequently sees patients who have attacks of cardiac asthma which are set off by cough and which can be prevented when this trigger mechanism is suppressed by proper sedation.

Dyspnea, which is usually the most prominent symptom in patients with congestive heart failure, may likewise exert harmful effects. The increased excursion of the diaphragm tends to favor the emptying of abdominal blood into the chest. Venous inflow is also favored by the lowering of the average intrathoracic pressure during the dyspneic state. In normal persons this increase in the blood expelled by the right ventricle is readily handled by the normal left ventricle, but in patients with congestive failure the left side of the heart is usually affected in greater degree than the right, and the blood therefore tends to accumulate in the lungs. Hence dyspnea, which is originally mainly due to congestion of the lungs, tends to cause more congestion and to aggravate itself. In patients who are subject to cardiac asthma attacks can

there must also be pain to be soothed, throw out a few specifics which our art did not discover, and is hardly needed to apply, throw out wine, which is a food and the vapors which produce the miracle of anaesthesia, and I firmly believe that if the whole materia medica, as now used could be sunk to the bottom of the sea it would be all the better for mankind—and all the worse for the fishes.

Suffer me now to lay down a few propositions, whether old or new it matters little, not for your immediate acceptance nor yet for your hasty rejection but for your calm consideration."

Those of us who are interested in the treatment of cardiac disease are unwilling to go so far as Oliver Wendell Holmes in the direction of therapeutic nihilism, for we believe that drugs when properly used are often of much value to our patients. How well grounded is this belief? Is it based upon wishful thinking and if not to what extent is it supported by objective and quantitative measurements? Our discussion of today will be concerned with an attempt to answer these questions.

The first principle to be discussed is the following one. *Although we are speaking broadly, unable to avoid or to remove the underlying causes of cardiac disease we can, in large measure at least successfully prevent and treat the precipitating causes of cardiac failure.* For the sake of convenience it is well to divide the underlying causes of heart disease into the more common factors and into the less common factors. The first group comprises vascular disorders including both hypertension and arteriosclerosis the rheumatic diseases (including rheumatic fever chorea and allied disorders) and syphilis. Only in the last mentioned disease is the etiological agent definitely known and a specific therapeutic attack available. Even here, once cardiac complications have set in, the specific therapy has relatively little to offer. Among the more important of the less common underlying causes of heart disease are bacterial endocarditis, congenital lesions, and chronic fibrosing diseases of the lungs. Against none of these do we have satisfactory methods of therapeutic attack. Finally, as relatively uncommon underlying causes of cardiac disease we have thymoma and pericardial infections, which are open to surgical attack, severe, long standing anemia, which can often be treated successfully, and avitaminosis which when recognized offers brilliant therapeutic possibilities. However, it is unfortunately true that until more is known about the nature of the common underlying disorders of cardiac disease, their prevention and treatment will remain in a most unsatisfactory state.

It is fortunate that in the majority of patients, heart failure does not occur until some precipitating factor is added to the underlying

but relatively nonprogressive disease process. The transitions from the asymptomatic stage of the disease to that of diminished cardiac reserve, and from the stage of symptoms only on effort to that of frank congestion with manifestations at rest are usually initiated by one of the following processes: infections (especially of the respiratory tract), changes in rhythm, cough, violent exertion, pregnancy, obesity, anemia, thrombosis, prolonged severe mental stress, and tachycardia, however brought about. The important point is that these trigger factors are in large measure preventable and once having arisen can usually be successfully treated. The management of cardiac disease in its earliest stages therefore resolves itself largely into the question of the prevention and control of these complications.

Of these several trigger factors, infection is probably the most important. Persons with cardiac disease must be trained to avoid exposure to inclement weather, to keep away from individuals with colds, to shun public gathering places during the winter months, to change wet clothes immediately, and when possible to spend part of the winter in a warmer climate. When such individuals are especially subject to respiratory infections they sometimes seem to be benefited by the use of vaccines containing the organisms which are the common secondary invaders in colds.

Exertion is probably—except in manual laborers—less important as a precipitating cause of heart failure than is generally believed. However one occasionally sees patients whose first manifestations of congestion can definitely be ascribed to some unusual violent effort such as a dash for a taxicab or a trolley car on a rainy day. Proper education of the patient prevents such eventualities.

Cough is an important and common precipitating cause of heart failure. It can usually be readily controlled by cough syrups containing codeine.

To discuss in detail the other trigger factors would lead us too far afield. Except for thrombosis which usually arises in the later rather than in the early stage of cardiac disease, these precipitating causes of heart failure can usually be prevented or adequately treated, provided sufficient care is devoted to the education of the patient.

The second principle to be emphasized is as follows. *The several and—at first sight—dis-similar methods which are available in treating persons with congestive heart failure have one fundamental action in common: they all tend to rest the heart.* In order to avoid misinterpretation this statement needs to be clarified. Like any machine which performs mechanical work, the heart is subject to variations in efficiency. The heart may expend more energy because it

tive heart failure Since only about 20 per cent of the patients who entered the hospital with congestive heart failure died in the hospital, the remaining 80 per cent being discharged improved, and since only 10 per cent of the patients who have been treated for several days or longer and died were found at postmortem examination to have heart failure as the chief immediate cause of death, it is evident that our direct mortality at present from congestive heart failure is only about 2 per cent. The indirect mortality—for conditions like infarction and pneumonia are in such patients usually indirect effects of the heart failure—is of course very great. However, these figures seem to indicate that the application of the principles of therapy which have been discussed has led to prolongation of life and to relief of suffering.

To summarize If the kindly, witty and skeptical Oliver Wendell Holmes were with us today asking his pertinent and disconcerting questions concerning the real value of the therapeutic measures employed in patients with congestive heart failure, we should have to admit that his statement that the general care of the patient is more important than drugs is just as true in our day as it was in his. The most valuable thing we can do for persons with chronic disease of the heart is to prevent the progression of the disorder by avoiding those conditions which act as precipitating causes of heart failure. Restriction of physical effort to that which can be performed without symptoms, prevention of undue mental and emotional stress, immediate attention to arrhythmias

and other causes of tachycardia, abolition of cough, supervision of pregnancy, reduction of obesity, management of anemia, and above all, prevention of infections—these are our most important measures of treatment. When in spite of our care congestive failure supervenes, rest, a proper dietary régime, the restriction of fluids, withdrawal of blood, and the use of opium which Holmes recommended, are of the greatest value. In addition to these things we would request that Dr. Holmes add digitalis, quinidine and the mercurial and xanthine diuretics to his small list of drugs which should not be cast into the sea. All of these measures appear to have one fundamental action in common, for either they diminish the work done by the heart without affecting its efficiency or they increase its efficiency so that a given performance of work is performed with a smaller expenditure of energy. In the final analysis the one effect of all therapeutic measures which are useful in the treatment of congestive heart failure is that of resting the heart.

And now for a final quotation from the medical sage of New England who closed his address as follows: "My friends and brothers in Art! There is nothing to be feared from the utterance of any seeming heresy to which you may have listened. I cannot compromise your collective wisdom. If I have strained the truth one hair's breadth for the sake of an epigram or an antithesis you are accustomed to count the normal pulse-beats of sound judgment, and know full well how to recognize the fever-throbs of conceit and the nervous palpitation of rhetoric."

## CANCER OF THE BREAST

### End-Results, Massachusetts General Hospital, 1927, 1928 and 1929

BY CHANNING C. SIMMONS, M.D.,\* GRANTLEY W. TAYLOR, M.D.,\* AND HERBERT D. ADAMS, M.D.\*

THE present communication is the sixth of a series of papers reporting the five year end-results of surgical treatment of cancer of the breast at the Massachusetts General Hospital. This report covers the three year period, 1927 to 1929, inclusive. The results of the surgical treatment of cancer of the breast have been studied and reported since 1894, a period of thirty-six years with the exception of two periods totaling eleven years.

In 1907 the results of the cases observed at the hospital during the ten year period 1894-1904 were reported on a three year basis.<sup>1</sup>

In 1921 a similar communication was made reporting the cases seen in the three year period 1910-1913 on a five year basis.<sup>2</sup>

In 1926, a report was made on the cases admitted to the hospital during 1918-1921.<sup>3</sup>

In 1934 two reports were published one giving the results of treatment during the three year period 1921-1923,<sup>4</sup> and another for the three year period, 1924-1926.<sup>5</sup>

In the last three reports the cases treated in the private ward were included with those seen in the General Hospital.

This communication is arranged, as far as possible in a manner similar to that of the previous reports to allow comparison, but changing conditions have made certain alterations necessary. The study of groups of consecutive cases made in this manner we believe, is the best method of ascertaining the results of a given method of treatment. On the other hand, many factors enter into the prognosis of the individual case, such as the age of the patient, the extent and duration of the disease and the

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sometimes be produced by voluntary increase in respiratory movements

The labored breathing which accompanies cardiac dyspnea may cause a well-marked increase in metabolism. Dyspneic patients often have a basal metabolic rate as much as 40 per cent above normal, and occasionally as much as 80 per cent. This of course increases the load on the heart.

An important delayed effect of persistent dyspnea is morphine addiction which develops when the drug has to be given repeatedly over a long period, and induces a cachectic state of the body in general, in which the heart is probably not spared.

Edema, another result of heart failure, also tends to have harmful effects. Accumulations of fluid in the abdomen and in the pleural cavities interfere with expansion of the lungs and hence produce dyspnea. When hydropericardium occurs, a heart which already empties with difficulty, becomes impaired in its ability to fill. Subcutaneous edema renders the tissues liable to infection, and heart failure is occasionally terminated by a streptococcal septicemia originating in this manner. In certain patients the blood flow through the peripheral edematous tissues appears to be increased because of impairment to oxygen diffusion.

The evil effects of pulmonary edema are too well known to require comment. However, it should be pointed out that edema fluid is often an excellent culture medium and that patients with edema of the lungs are very subject to bronchopneumonia, which is one of the most frequent causes of death in persons with congestive heart failure. Even in the absence of subcutaneous edema the presence of numerous râles in the lungs of a patient with cardiac disease is usually an indication for the administration of a diuretic drug.

Myocardial edema is not rare in patients with congestive failure. It probably imposes a barrier to oxygen diffusion and interferes with the recovery process in muscle fibers which are in poor condition to tolerate such impairment.

These examples illustrate how certain symptoms, themselves the cause of heart failure, tend to aggravate heart failure. The treatment of these symptoms is therefore not simply a matter of making patients more comfortable but is a fundamental step in the breaking of a vicious cycle which when untreated leads to death. Such a conception explains the great benefit which can be obtained by codein when it abolishes cough, by morphine when it relieves dyspnea, and by diuretic drugs, even in patients with minimal edema. The last point needs to be especially emphasized because it is not generally appreciated. We are all cognizant of

the importance of maintenance doses of digitalis in persons who have recovered from outspoken congestive heart failure. Maintenance doses of diuretics are also very useful in such subjects. It is important that ambulatory patients, who have had edema recently, should weigh themselves daily and take theophyllin or some other diuretic drug whenever the scales, by showing sudden gain in weight, point toward the beginning of reaccumulation of fluid in the body. By this plan certain subjects who would otherwise remain practically bedridden can be kept in an ambulatory state and relatively free of symptoms for months and occasionally for years.

A final principle of therapy. *If the foregoing points are borne in mind and patients are treated accordingly, only a very small percentage of the patients who have congestive heart failure die of it, although a good many die with it as the result of various complications.*

During the past ten years the general plan which has been followed at the Vanderbilt University Hospital in the treatment of patients with congestive heart failure has remained relatively unchanged, except that the principles which have been discussed have been recognized as of great importance and have been applied with increasing enthusiasm. We have recently undertaken a survey of the fatal cases in an attempt to determine whether any real advances in therapy have been made in recent years. It was felt that a comparison of the patients dying in the last five years with those dying in the previous five years might be helpful in this regard. In order to eliminate errors in diagnosis, the studies have been limited to patients who have come to autopsy. The various types of heart disease were about equally common in the two five-year periods. The median duration of life after the onset of congestive failure was estimated as accurately as possible from the case histories. In the past five years the value has been eighteen months as compared with eleven months during the preceding five year period. A study of the chief cause of death has been made in both groups of cases. Uncomplicated congestive failure has in the last five years accounted for 19 per cent of the deaths, while during the previous five years the figure was 32 per cent. Many of these patients died within the first two days in the hospital before therapy could be effective. When these are eliminated it appears that only 9 per cent of the deaths which occurred during the last five years in patients with congestive failure were attributable to uncomplicated congestive failure. The value for the preceding five-year period was 24 per cent. In the recent years uremia, pneumonia and massive pulmonary infarction have each accounted for more deaths than has uncomplicated congestive failure.



## OPERATIVE MORTALITY

There were 4 postoperative deaths. Three of these were due to pulmonary embolism, and in the fourth the cause could not be determined. The operative mortality was therefore, 4 cases in 180 operations or 2.2 per cent.

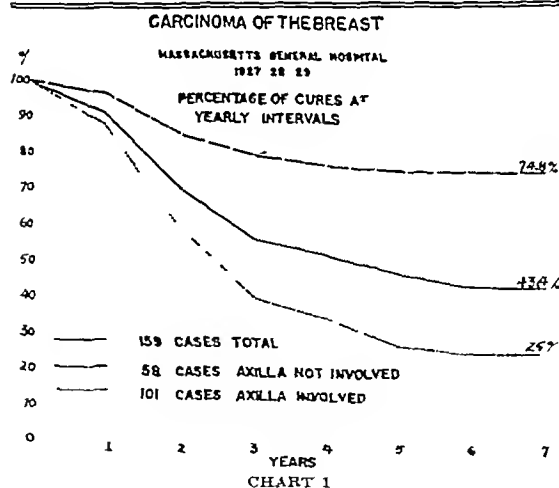
## RESULTS

Of the 159 primary cases, in which the disease was confined to the breast or breast and axilla 69 are known to be living without evidence of disease five or more years after operation (43.4 per cent). This is to be compared with the figures given in previous reports (table 3). The

TABLE 3  
COMPARISON OF RESULTS OF TREATMENT

Period	Percentage Cures
1894-1904	19
1911-1914	27
1918-1920	30
1921-1923	35
1924-1926	41
1927-1929	43

percentage of survivals at yearly intervals is shown graphically in chart 1.



## DURATION OF DISEASE AND RESULTS

Taken as a whole the patients sought advice for a suspicious tumor of the breast somewhat earlier than was previously found to be the case. Of the cases seen in the General Hospital on which we have accurate data, it was found that the average duration of the disease in the cases in which the axillary glands were not involved was 9 months and in the cases in which the glands were involved 12.6 months. The median duration of the two groups which is somewhat more accurate than the average duration was 3 and 6 months, respectively. The

duration and its relation to the extent of the disease are reflected in the results (table 4). The percentage of cases in this series without involvement of the axillary glands is given in table 5 for comparison with the previous reports.

TABLE 4  
DURATION OF DISEASE—RESULTS

	Average Duration	Median Duration	Percentage Cures
Glands not involved	9 months	3 months	74
involved	12 months	6 months	24

The possible relation of the social status of the patients to the results of treatment is reflected in comparing the patients seen in the private ward in whom 51 per cent showed no involvement of the axillary nodes with those in the general wards of whom 34 per cent were in this group. This is again shown in the results of operation there being 53.5 per cent cures in the private patients as against 38 per cent of the patients in the General Hospital.

TABLE 5  
EXTENT OF DISEASE

Years	Percentage Limited to Breast
1894-1904	33
1911-1913	31
1918-1926	30
1921-1923	28
1924-1926	41
1927-1929	38

Of the 58 patients in whom the disease was limited to the breast 44 or 74.8 per cent were living without evidence of disease five or more years after operation. Of the 101 cases in which the axillary glands were involved by disease 25 per cent were cured (chart 1). In other words, a patient has three chances out of four of obtaining a surgical cure if the disease as far as can be determined, is confined to the breast, and only one chance out of four if the axillary glands are diseased (table 6) (chart 1).

TABLE 6  
CURES AND EXTENT OF DISEASE

	Cases	Cures	Percentage Cures
Axillary glands not malignant	58	44	74.8
malignant	101	25	25

## PATHOLOGY AND RESULTS

Since 1925 the Pathological Laboratory of the Massachusetts General Hospital has in most in-

type of cancer. In practice, therefore, it is necessary to judge each case separately.

Taken as a whole the results of this series of cases are slightly better than those of the previous groups reported and are comparable to those obtained in other large clinics. It is doubtful if much more can be accomplished by surgery until the patients are seen earlier before metastases have taken place. Certain cases of diffuse cancer of high malignancy are probably incurable by any method of treatment now employed at the time the first symptom is noted. On the other hand, there still remains a large group of patients who have been conscious of a painless tumor of the breast for several months before consulting a physician. This situation can be improved only by the education of the public, and efforts along this line are being made by the State and local Departments of Public Health, the American College of Surgeons, the American Society for the Control of Cancer, and the United States Public Health Service.

In this communication the term "cure" is applied to those cases living without evidence of disease five or more years after operation. A patient dying of late recurrence more than five years after operation is considered as a failure. Five cases (7 per cent) of the patients living at the end of five years died later of a return of the disease, and in all probability certain of the patients now apparently well will develop late recurrence. Of the 107 cases operated upon in the General Hospital the end result is known in all but one. This case is recorded as a failure, although the patient may well be living for the tumor was small and of low malignancy and the axillary glands were not involved. Postoperative deaths are considered as failures. Eleven cases operated upon in the private ward have been excluded on account of lack of sufficient data to permit classification.

By radical operation is meant the removal of the breast, with a large amount of subcutaneous tissue, from the midsternal line to the border of the latissimus dorsi, with both pectoral muscles and the contents of the axilla. A portion of the upper part of the rectus sheath is taken in certain instances. Perfect first intention healing was not obtained in every case. On the other hand, the wounds could be closed in practically every instance and secondary skin grafts, made necessary by a sloughing of the flaps, were resorted to in only a few cases.

#### OPERABILITY

The operability of the cases admitted to the hospital does not represent the operability of the cases at the time of first consultation with a physician. In the General Hospital unoperated cases were weeded out in the Tumor Clinic

and Out-Patient Department. On the other hand, many of these cases were hospitalized in order that they might receive adequate radiation treatment. No case is considered suitable for an attempt at radical cure by surgery if the disease has extended clinically beyond the axilla. As a routine, x-ray films of the chest, pelvis and spine are taken before operation to rule out remote metastases. Cases in which formerly a palliative operation would have been performed are now referred to the X-Ray Department for treatment.

During the three year period, 260 cases were admitted to the hospital. Of these, in 181 the disease was limited to the breast or to the breast and axilla, while 79 were admitted for radiation treatment.

TABLE 1  
CASES AVAILABLE FOR STUDY

1	Primary cases	220
	a Disease limited to breast	69
	b Disease limited to breast and axilla	112
	c Advanced incurable by surgery	39
2	Recurrence after radical operation	17
3	Recurrence after incomplete operation	23
		260

The 181 primary cases in which the disease was limited to the breast and axilla may be subdivided as follows:

TABLE 2  
PRIMARY OPERABLE CASES

	Cases
1a, Disease limited to breast	
Suitable for study	57
Refused operation	1
No follow up (considered dead of disease)	1
Died without recurrence less than 5 yrs	5
Private cases excluded on account of insufficient data	5
	69
1b Disease limited to breast and axilla	
Suitable for study	97
Died without recurrence less than 5 yrs	5
Postoperative death (considered as failure)	4
Private cases excluded on account of insufficient data	6
	112

Excluding the 10 cases dying of other disease without evidence of recurrence within five years, the case refusing operation and the 11 cases operated upon in the private wards and in which no data are available, there remain 159 primary cases suitable for study. These patients were operated upon by 22 surgeons, but 138 of the operations were performed by members of the Tumor Clinic Staff.

## OPERATIVE MORTALITY

There were 4 postoperative deaths. Three of these were due to pulmonary embolism and in the fourth the cause could not be determined. The operative mortality was therefore, 4 cases in 180 operations or 2.2 per cent.

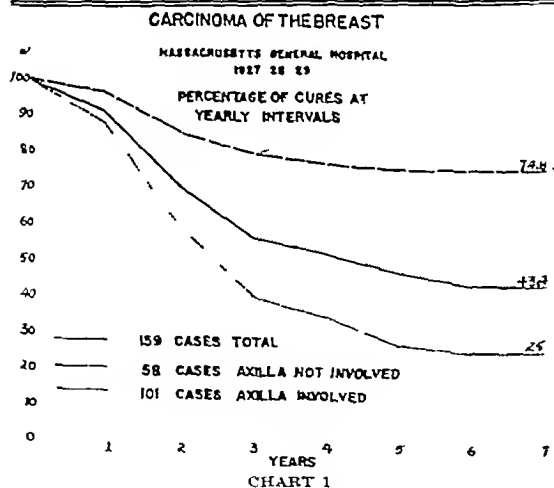
## RESULTS

Of the 159 primary cases in which the disease was confined to the breast or breast and axilla 69 are known to be living without evidence of disease five or more years after operation (43.4 per cent). This is to be compared with the figures given in previous reports (table 3). The

TABLE 3  
COMPARISON OF RESULTS OF TREATMENT

Period	Percentage Cures
1894-1904	19
1911-1914	27
1918-1920	30
1921-1923	35
1924-1926	41
1927-1929	43

percentage of survivals at yearly intervals is shown graphically in chart 1.



## DURATION OF DISEASE AND RESULTS

Taken as a whole the patients sought advice for a suspicious tumor of the breast somewhat earlier than was previously found to be the case. Of the cases seen in the General Hospital on which we have accurate data it was found that the average duration of the disease in the cases in which the axillary glands were not involved was 9 months and in the cases in which the glands were involved 12.6 months. The median duration of the two groups which is somewhat more accurate than the average duration was 3 and 6 months, respectively. The

duration and its relation to the extent of the disease are reflected in the results (table 4). The percentage of cases in this series without involvement of the axillary glands is given in table 5 for comparison with the previous reports.

TABLE 4  
DURATION OF DISEASE—RESULTS

	Average Duration	Median Duration	Percentage Cures
Glands not involved	9 months	3 months	74
Involved	12 months	6 months	24

The possible relation of the social status of the patients to the results of treatment is reflected in comparing the patients seen in the private ward in whom 51 per cent showed no involvement of the axillary nodes with those in the general wards of whom 34 per cent were in this group. This is again shown in the results of operation there being 53.5 per cent cures in the private patients as against 38 per cent of the patients in the General Hospital.

TABLE 5  
EXTENT OF DISEASE

Years	Percentage Limited to Breast
1894-1904	33
1911-1913	31
1918-1926	30
1921-1923	28
1924-1926	41
1927-1929	38

Of the 58 patients in whom the disease was limited to the breast 44 or 74.8 per cent were living without evidence of disease five or more years after operation. Of the 101 cases in which the axillary glands were involved by disease 25 per cent were cured (chart 1). In other words, a patient has three chances out of four of obtaining a surgical cure if the disease as far as can be determined, is confined to the breast and only one chance out of four if the axillary glands are diseased (table 6) (chart 1).

TABLE 6  
CURES AND EXTENT OF DISEASE

	Cases	Cures	Percentage Cures
Axillary glands not malignant	58	44	74.8
malignant	101	25	25

## PATHOLOGY AND RESULTS

Since 1925 the Pathological Laboratory of the Massachusetts General Hospital has in most in-

stances, given an opinion as to the degree of malignancy of the tumors, dividing them into three groups of malignancy, high, medium and low. The majority of the cases fall in the second group. The grading is based on the degree of differentiation of the cells, that is, the tendency to form glands and evidence of secretory activity, the uniformity in the shape and size of the cells, the number of mitotic figures and the tendency of the tumor to infiltrate surrounding tissues and lymphatics. The relation of the degree of the malignancy to the prognosis has been shown in previous communications, and the present series substantiates the findings. There were 15 cases in which the end-result was known that were classed as being of low malignancy and of these 14 are well. The axillary glands were involved in only one case. In the group of medium malignancy there were 90 cases of which 43 are to be regarded as cures, and, in the group of high malignancy, there were 47 cases with 11 cures. The three groups gave 93 per cent, 49 per cent, and 23 per cent cures, respectively (table 7) (chart 2).

TABLE 7

## PATHOLOGICAL INDEX OF MALIGNANCY AND CURES

(Specimens from 152 cases available for review)

(Four postoperative deaths and one untraced case excluded)

	Cases	Cures	Percentage Cures
Grade 1	15	14	93
2	90	43	49
3	47	11	23

## CARCINOMA OF THE BREAST

MASSACHUSETTS GENERAL HOSPITAL

1927-28-29

PATHOLOGICAL INDEX OF MALIGNANCY

PERCENTAGE OF CURES AT YEARLY INTERVALS

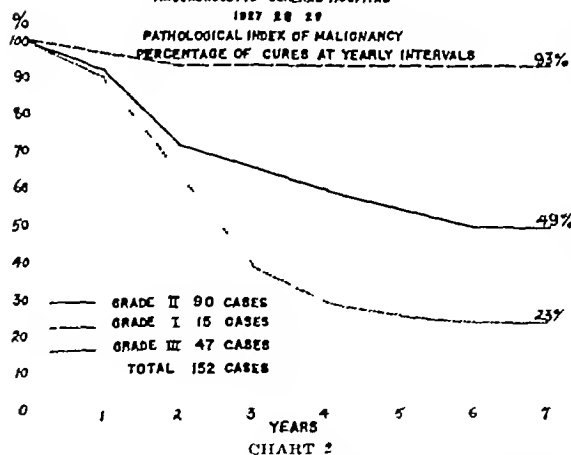


CHART 2

Of the 16 cases of cancer of low malignancy, the axillary glands were diseased in only 1 instance. Of the 94 cases classed as being of medium malignancy, 57 showed involvement of the

axillary glands, and, of the 45 classed as being of high malignancy, the axillary glands were involved in 38 (table 8). It is to be inferred from these figures that the degree of malignancy has a definite relation to the rapidity of the growth and spread of the disease. In this series a cure was obtained by radical operation in every case of cancer of low malignancy in which the disease was confined to the breast.

TABLE 8

## PATHOLOGICAL AND EXTENT OF DISEASE

(Specimens from 155 cases available for review)

	Cases	Axilla Involved	Percentage Involvement
Grade 1	16	1	6
2	94	57	60
3	45	38	84

## RESULTS OF TREATMENT AND AGE OF PATIENT

It is generally accepted that cancer in young women, that is individuals under 40, is more malignant than in older women. In the last series studied, of 17 patients under the age of 40, 6 or 34 per cent were cured by operation. In this series only 10 per cent of patients under 40 were cured by operation.

In analyzing the cases further, it was found that in the previous group in 8 of the 17 cases (48 per cent) the disease was confined to the breast and the 6 cures were obtained in this group. In the present series there were 20 cases under 40 years of age. There were no cases of low malignancy and only 4 in which the disease was confined to the breast, 2 of which were cured.

We agree with the statement often made that the prognosis of cancer of the breast, taking the cases as a whole, is worse in women under 40 years of age, but believe that a cancer of low malignancy curable by surgery is often seen before 40, and the fact that the patient is in the third decade of life should not alone deter one from attempting to obtain a cure by radical operation. The results obtained in the different age groups compared with those obtained in the series reported in 1924 to 1926 are shown in table 9.

TABLE 9

## AGE AND RESULTS

1924-25-26		Ages	1927-28-29	
Percentage Cures	Cases		Cases	Percentage Cures
34	17	31-40	20	10
40	53	41-50	41	51
44	50	51-60	47	44
40	11	61-70	33	49
33	9	71-80	10	70

It will be noted that the figures from the present series coincide more closely to the prevailing ideas of the relation of the curability of cancer of the breast to the age of the patient. It also illustrates two facts, first, the fallacy of drawing conclusions from a small series of cases and secondly that each case should be considered individually before determining on any form of treatment.

#### PROPHYLACTIC RADIATION AND RESULTS OF TREATMENT

A special group of 94 consecutive cases observed at the General Hospital and operated upon by members of the Tumor Clinic Staff was studied to determine the effects of preoperative prophylactic radiation treatment in conjunction with surgery. Forty-two patients were referred to the X-Ray Department and received preoperative radiation treatment. A series of four exposures was given on four successive days totaling 800 r units. This, at the present time would be considered a light treatment, but was comparable to that given in many clinics during the years under consideration. To make a fair comparison of the treatment, the cases were divided into those with and without axillary involvement. The results are shown in table 10.

TABLE 10

RESULTS—PREOPERATIVE PROPHYLACTIC RADIATION

	Cases	Cures	Percentage Cures
<i>Glands Not Involved</i>			
Radiation	13	10	77
No radiation	16	12	75
<i>Axillary Glands Involved</i>			
Radiation	28	7	25
No radiation	36	9	25

From these figures it is to be inferred that preoperative, prophylactic radiation as given to this group of cases did not improve the prognosis. This has been our experience in previous groups of cases studied, and it is difficult to reconcile the results with the reports of certain other observers. It would be interesting to determine if the results of this treatment varied with the degree of malignancy of the tumor or age of the patient, but, if the cases are divided

in this manner, there are too few in each group to make the figures of value. An artificial menopause by radiation treatment was not brought on in any case in this series.

#### SUMMARY

The five year end-results of 159 cases of cancer of the breast treated by radical operation at the Massachusetts General Hospital during the three years 1927, 1928 and 1929, are reported. The results are compared with similar groups of cases previously analyzed.

There were 43.4 per cent of five year cures following radical operation. Of the 58 cases in which the disease was limited to the breast 44 or 74.8 per cent were living without evidence of recurrence from five to seven years after operation. Of the 101 cases in which the axillary glands were involved, 25 or 25 per cent were living without evidence of disease from five to seven years after operation.

The prognosis was found to depend more on the extent of the disease and the pathologic index of the malignancy of the tumor than on any other factors. This coincides with the findings in the former groups studied.

The median duration of the disease before operation of the cases without axillary involvement was three months. The median duration with axillary involvement was six months. The importance of early diagnosis and treatment is shown by comparing results of operation in these two groups.

Preoperative x-ray treatment was given to a certain number of these patients. It had no effect on the results when the cases were placed in comparable groups. The dosage was much less than that advocated at the present time but was similar to that given at other institutions during the period under investigation.

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## ADDRESS TO THE STAFF OF THE WORCESTER CITY HOSPITAL

May, 1936

BY SAMUEL B. WOODWARD, M.D.\*

**P**RESIDENT Ward, who thinks that I was a member of the original staff of this Hospital has asked me to tell you the story of its early years. As the youngest of the fourteen men who formed that staff would, if living, be 90 years of age and the oldest 125, it seems to me superfluous to state that he is mistaken in his assertion. No, I was a college freshman when, in 1871, the report of a Committee of the City Government appointed to "consider the expediency of establishing a City Hospital" called attention to the fact that there were in Worcester no hospital facilities whatever, except those of the Sisters of Charity Hospital on Shrewsbury Street which was "so small and restricted in its operations as to be of little public importance." It must be to you younger men difficult to realize that but sixty-nine years ago this city of then some 20,000 inhabitants depended on an institution with but four or five beds to care for those who were ill, while for the stranger within its gates there was no recourse but the hotel bedroom or a cot at the poor farm or, if seriously injured temporary treatment in a room connected with the police station in the City Hall basement and on the first train available transfer to the Massachusetts General Hospital in Boston.

The Insane Hospital on Summer Street, opened in 1832 to provide a refuge for the pauper insane had of course long been prominent on the eastern horizon, but there was no provision whatever for the institutional care of the sick and injured but that provided by the sisters of St. Anne's Convent in the general hospital already mentioned, which the Rev. John J. Power had in 1867 thrown open to a limited public. To the west there was, so far as I know, no general hospital until New York was reached and not until after the Civil War was any attempt made to erect one.

When in 1794 the thirty-six physicians who founded the Worcester District Medical Society came booted and spurred from the surrounding country on their sturdy nags, there was but one of them who had ever seen a hospital, and incidentally but one who had ever heard a medical lecture or attended a medical school. They came here in protest against the arrogance of the Massachusetts Medical Society which in twenty-three years had elected but one member from a town west of Framingham and by persistent insistence upon articles of incorporation

they did eventually force the state society to change its narrow and exclusive policy, to extend its wings beyond Suffolk and Middlesex and, eventually, to include in its membership all medical men of respectable attainment throughout the State.

As I have said, there was no hospital in Worcester for these men to visit. There had never been one, if we exclude those temporarily established during the frequently recurring epidemics of smallpox, those where before and even after Jenner's day people went to be inoculated with the disease. We know that in 1776, when 4 per cent of the inhabitants died of smallpox, which would mean nearly 8,000 at the present time, Dr. Joseph Lynde had charge of the smallpox hospitals and that in the year of this assemblage of physicians several such places were opened under the care of Dr. Elijah Dix, grandfather of the famous Dorothea Dix, who did so much to improve the care of the insane.

In 1850 great efforts were made by Dr. Wilder of Leominster to establish here a county hospital, but sufficient money could not be obtained and the project was abandoned. The District Medical Society was prominently identified with this movement.

In 1851 Dr. Seth Rogers opened his water cure establishment on the street still appropriately called Fountain, where patients were given the opportunity to receive the peculiar benefits supposed to be inherent in cold water baths internally and externally applied. This hospital was in existence for thirteen years and until Dr. Rogers left town in 1864. Strangers used to be taken up to look at least at the outside of the building as one of the city sights.

Then came the Civil War, and the opening of the Wellington Hospital in 1862 and the Dale Hospital in 1864 may well have suggested to Leabod Washburn and to George Jacques the desirability of some provision for the care of sick and injured civilians. At any rate in the nine years, 1862 to 1871, in which latter year the City Hospital was finally opened, no less than six hospital projects were brought before our citizens. Mr. T. W. Wellington, who lost two sons in the war, convinced that the Massachusetts sick and wounded were not properly cared for in Washington, tried desperately to persuade the Secretary of War to have them removed to the state from which they had enlisted. His efforts were unsuccessful and determined to care at least for those

\*Woodward, Samuel B. — President Massachusetts Medical Society 1916-1917. For record and address of author see This Week's Issue page 563.

who became sick or disabled in the various camps of instruction (there were two of them in Worcester) he opened at his own expense and maintained for five months a hospital at 110 Mason Street where some fifty or sixty patients were attended by Dr Oramel Martin with the occasional assistance of other physicians. Recruiting had ceased, the regiments in Worcester had gone to the front, there were therefore, in a short time no patients, and, the hospital opened in August 1862 was closed in January of the next year. The steward in charge was one Lunsford Lane, a former soldier then living in Worcester and well known to Mr Wellington.

In August, 1864 the government, reverting its attitude opened on the grounds of the abandoned, much turreted building on Providence Street erected for the use of the Botanic Medical School later occupied by the Worcester Female Seminary and now by Worcester Academy, a hospital of 1,000 beds with fourteen one-story wooden wards, 160 feet long by 30 in breadth. It was never completely filled but at one time as many as 600 patients were being cared for. Dedicated with much ceremony with the Governor and his staff present in February, 1865, but two months before the fall of the Confederacy it was less than a year later (the emergency for which it was created having passed away) discontinued the material sold and the site abandoned.

In 1869 Mr Isabod Washburn died leaving in the hands of trustees a sum of money to be expended in the foundation and maintenance of a hospital in memory of his deceased daughters. The next year Dr Albert Wood, City Physician in his annual report strongly advocated the establishment by the City of a hospital of at least twenty-five beds and, as the Washburn bequest could, under the terms of his will, not be used until five years after his decease the City with commendable and unusual promptitude obtained from the Legislature authority to establish and maintain a hospital for the reception of persons who "by misfortune or poverty should require relief during temporary sickness." The Act was passed May 25, 1871 and with surprising speed in five months the Abijah Bigelow house on the northwest corner of Front and Church Streets was rented and altered so that it could accommodate eight to ten persons. Dr John G Park was made Superintendent a staff of twelve physicians was appointed and the first patient received on October 28 of the same year. The building was immediately crowded and during the first twelve months twenty applicants were rejected for want of room. Dr Park who afterwards became the Superintendent of the Worcester Insane Hospital, was not particularly interested in the work and Dr Leonard Wheeler, who had just come to town

took over the superintendency before the end of the first year, namely, in June 1872. His name is appended to the first report in December of that year. Dr Wheeler, as you all know, died but a few months ago and the changes in Worcester hospitals during his life were certainly stupendous. A staff of fourteen physicians for two more were added during the first year to care for a hospital which in fifteen months received but 176 patients sounds absurd, but one must remember that this was a city institution and no leading physician could well be passed over and, as I remember it, none were. The original staff consisted of the following well known men

#### CONSULTING PHYSICIANS

Dr Joseph Sargent the first man who succeeded in breaking down the monopoly established by Doctors Green and Heywood who by refusing to consult with any new physician who tried to locate here had driven several away including Dr Homans father of Doctors John and Charles Homans the well-known Boston physicians.

Dr F H Kelly later Mayor and Dr Merrick Bemis afterwards Superintendent of the Insane Hospital were also on this Board.

#### VISITING PHYSICIANS

Rufus Woodward	Albert Wood
George H Bates	Emerson Warner
Oramel Martin	George E Francis
Henry Clark	John G Park
Joseph N Bates	Henry W Simpson
Thomas H Gage	John O Marble
J Marcus Rice	Leonard Wheeler

You will note that all the medical men are called physicians. It was not until 1881, ten years later that a distinction was made and the list divided into Visiting Surgeons and Visiting Physicians. Whether during those early years the man on duty treated both medical and surgical cases indiscriminately I do not know, but it seems to me not improbable for when the Memorial Hospital was opened in 1888 three physicians were appointed to care for women and three for children, and, under my care as one of those responsible for patients above the age of puberty, I treated pneumonia and heart disease, operated for hernia, did tracheotomies and amputated limbs to say nothing of setting broken bones and caring for intestinal disorders. It takes six doctors now to do what one did or was supposed to do in those days. He did what he could, did it more or less well and nobody thought of preparing himself for any specialty, barring those who expected to confine their practice to the care of eyes and ears. There was no oculist and anirist connected with the City Hospital until Dr Lewis E Dixon received this appointment in 1874 or a microscopist and pathologist as he was called, until the Hospital had been four years in operation, when Dr W H Workman was appointed to this position.



It may interest you to know that Dr Park's salary was fixed at \$700 a year, that the Matron's compensation was \$25 per month and that the total expenses for the first year were in the neighborhood of \$6,000, while ten years later they were but \$8,000.

In their very first report the Trustees complained of the inadequacy of accommodations and undesirability of the situation, declaring that a hospital of forty beds, at least, in a more retired situation was desirable. Things began to move with great speed.

In March, 1872 Mr George Jacques, one of the Trustees, deeded to the City a hospital site of three and one half acres of land on the south side of Prince Street. Prince Street, now Jacques Avenue, was then a narrow way running through the Jacques land from near his house on Wellington Street as far as King Street. Mr Jacques' deed provided that it should be widened to the extent of fifty feet and "so made as to be in reasonably good condition for easements to pass over", while \$25,000 had to be appropriated and laid aside by the City within one month from the date of the deed, said money to be used for the erection of a hospital of not less than twenty-five beds and that within three years.

Mr Jacques died five months later, leaving the bulk of his estate with an estimated value of over \$200,000 for the furtherance of the same object, the erection of a hospital for the sick poor. This estate included a large tract of unimproved and unoccupied land twenty-one acres in all, on Wellington and Chandler Streets, on both sides of Prince Street, and included the land previously deeded, where the City Hospital now stands.

In 1874 the hospital was moved from Front Street to the Jacques homestead on Wellington Street, while awaiting the action of the City in the matter of erecting a proper hospital on the site provided. Sixteen patients could then be cared for and two years later the building of two wooden pavilions, with accommodations for five to eight patients respectively, nearly doubled the accommodations provided. A room for autopsies was arranged in the old barn.

It is pleasing to note that delay and shilly shally are not confined to our times and that Mr Jacques built better than he knew or perhaps knew his city better than most people. He provided in his will that the City should forfeit \$200 every month until a permanent hospital was built on the site provided by him and for eight years, while the Trustees and the city fathers debated and talked and talked some more and nobody wanted to have the hospital built where Mr Jacques had planned to have it, \$200 came to the Jacques fund twelve times each year. The Trustees thought that the lot was too long and too narrow, that it faced the

wrong way, that it was too far away from the city center and that the site where they were was the better one and the City applied to the Supreme Court for a release from the obligations of the original deed. The Supreme Court refused this request, the Trustees finally agreed to the plan and incidentally to the architect's plan. In 1878 the City got busy, in 1880 work was begun and in December, 1881 the hospital with two wards to accommodate forty patients, an administration building, a kitchen and a laundry, was finished and occupied.

It may be of interest at this point to call attention to the fact that in 1878 a committee of the Trustees, appointed to consider the rearrangement of the city land on Prince Street stated "If the proposed arrangements be carried out there will be a tract 400 by 700 feet thus furnishing abundance of land for hospital purposes and an opportunity to accommodate such buildings as may be hereafter required by the Memorial Hospital or the Washburn Free Dispensary, if arrangements should be made for their joint occupancy of land belonging to the City." Four hundred feet by 700 for both hospitals and this at a time when, as I shall show in a moment, one story buildings only were to be thought of. Four hundred feet by 700 for both hospitals. Ye gods! How short a time ahead can anyone really look.

As an explanation of the plan of the original hospital and an instance of the medical feeling of the time, be it noted that the committee of the staff quoted numerous authorities to prove that no more large or high buildings for hospitals should be in the future erected, "because the aggregation of the sick in such buildings begets and brings to maturity a most formidable enemy which has been christened hospitalism." "All statistics show," said they, "that the rate of mortality increases in a nearly geometrical ratio to the number associated together," and they quoted a medical authority who said, "It has been shown that an outbreak of surgical fever can with certainty be predicted when the number of severe cases reaches a given point. In a ward of fourteen beds, if there be more than seven open wounds, then septic disease will certainly break out." It was for this reason that the Hospital was built in the form adopted, with the expectation that the two one story wards would, after a few years' use, be destroyed and others erected in their place. With this objective in view, at the Boston City Hospital, while I was an intern, a ward was built of wood so that the loss by intended destruction would be minimized. The staff committee went on to say—"What the sick need is fresh, pure air. The fewer there are crowded together, charging the air with their fetid and poisonous exhalations, generating the miasma of hospitalism, the better their chances

of recovery." Sir James Simpson defined hospitalism as "the unfavorable action of a crowded hospital on its inmates" and with every wound streaming with pus, with doctors and nurses with unwashed hands passing from one dressing to another with no wound unless by some miracle healing by first intention. One can understand that pure air was a consideration devoutly to be wished for, but practically impossible of attainment. What one of our bar Dr Hunt, if he is here ever saw a case of so called hospital gangrene? In 1878 I saw in Boston such an epidemic that all operating was suspended for several weeks for the simple reason that every person operated on was attacked by this disease and every one, without exception died.

In 1881 the Hospital opened on its present site with Dr Everett in Dr Workman's place as pathologist. In 1883 I succeeded him in that position and Dr Getchell became the first intern. There was no great excitement over these appointments. Neither Trustees, Committee of the Staff nor the Superintendent mentioned the important event in their reports.

In 1886 I became a visiting physician and in 1887 a visiting surgeon, still being retained as pathologist and doing autopsies directly under the surgery where I might have provided the subject a short time earlier. Dr Danforth finally took my place as pathologist and in 1902 I resigned from the staff and was made a consultant one of those people that nobody ever consults except Dr Hunt, who once asked me to my great gratification to see a case with him.

I may note that Ray Greene was an intern in 1889 and Fred Baker, who was four (our) pathologist for nearly 42 years, was the intern in 1891 that when the present hospital building was opened there had been 2,700 patients treated in twelve years, in comparison with the 9,988 admitted in the one year 1935 that the Training School was opened with five pupil nurses in 1881 and incidentally that the first graduation held under a tent in the yard 43 years ago was honored (?) by an address from the present speaker, that the personnel of the Hospital when on Wellington Street consisted of a superintendent, a matron, one male and one female attendant, a night watchman, a cook and assistant, a janitor and a laundress that after the removal one male and one female attendant were added, an additional assistant to the cook was appointed as also a fireman, the janitor and the laundress being apparently dispensed with.

People in those days did not, as a rule, wish to go to hospitals where they were liable to save the doctors experimented on them, yet there was one disease then extremely prevalent, now rare indeed that helped to keep the meagre number of beds in the buildings on the two sites first utilized from what a distinguished American has called innocuous desuetude. This disease was typhoid fever.

Out of 176 admissions in 1872, twenty-three—one in every seven—were typhoid cases. Eleven cases of typhoid fever were admitted in 1873 ten cases of typhoid fever were admitted in 1874 fifteen cases of typhoid fever were admitted in 1875 thirteen cases of typhoid fever were admitted in 1877, nine cases of typhoid fever were admitted in 1878 eleven cases of typhoid fever were admitted in 1879, and thirteen cases of typhoid fever were admitted in 1880. One case to each seventeen of the 1,595 admissions for the eight years. Did you in 1934 have 552 cases of typhoid fever among the 9,384 patients admitted to the wards? You did not, and if you had received that number, you would have been, pardon the expression almost scared to death. In 1928 you received three, in 1929 seven in 1930 seven and practically none in the last few years. Typhoid is gone or nearly so but I can remember when a whole ward of typhoid cases cluttered the Boston City Hospital for weeks on end.

"Firsts" are always interesting to those who have had anything to do with them. I saw in 1878 Dr Fildes do the first ovariotomy done in a hospital in Boston. I myself did what I thought a wonderful operation when I opened the abdomen to close a perforating typhoid ulcer. Called one afternoon by Dr Gage in consultation I stood by while he performed the first appendectomy done in Worcester, and, *inabile dictu*, I induced the Chairman of the Trustees to allow me to accept a fee from a patient I had sent in who resented being classed as a "pauper", as he put it. This was the first time any member of the staff ever received pay for his services. The next year the rules were changed and fees under certain conditions were allowed.

Gentlemen the world does move but sometimes it seems to move very slowly. It has, however, moved medically so fast since I retired from practice fifteen years ago that I can no longer understand the articles in the medical journals and am reduced to reading the advertisements and the editorials.

## NEW HAMPSHIRE MEDICAL SOCIETY

ARTIFICIAL PNEUMOTHORAX IN THE TREATMENT  
OF TUBERCULOSIS\*

BY JOHN D. SPRING, M.D.†

THE four great corner posts upon which our treatment of tuberculosis is set are rest, food, fresh air and education. Of these four, by far the most important is rest. The part it plays, however, depends upon the organ affected. A tuberculous knee can be put into a cast and out of function more easily than a tuberculous kidney. The lung occupies a sort of middle ground as it can be put at varying degrees of rest.

When simple bed rest will not control active disease, and lesions are progressive, we have surgical means of putting the lung at rest. The three chief methods are phrenotomy, artificial pneumothorax, and thoracoplasty. The first cuts down lung function by paralysis of the diaphragm, the third by reducing the size of the bony framework, but the second, the subject of this paper, induces rest by reducing the available space which the lung can occupy in the chest cavity, leaving the diaphragm and chest wall in condition for function later on if desired.

In 1820 James Carson of Liverpool discussed the possibilities of artificial pneumothorax, but Carlo Forlanini of Milan, in 1882, was the first to perform the operation.

The indications are primarily progressive caseous lesions in one lung, although contralateral disease is not a barrier, for example, hemoptysis, spontaneous pneumothorax, and tuberculous pleurisy with effusion. Contraindications are renal or cardiac failure, extensive emphysema, tuberculosis of the larynx, or of the intestine sufficient to interfere with the patient's nutrition.

A survey of 600 cases collected by Matson over a period of twelve years throws interesting light on the worth of the proceeding. In those patients where a satisfactory collapse of cavities and adequate functional rest could be obtained, 48 per cent made clinical recoveries, eighteen were arrested, twelve improved, or unimproved, and twenty-two were dead. Where the collapse was poor due to adhesions 11 per cent were clinically well, twelve arrested, nineteen improved or unimproved, and fifty-eight were dead. A third set of cases, used as controls, where no air could be introduced, showed after prolonged sanatorium treatment, 5 per cent clinically well, nine arrested, twenty were im-

proved or unimproved, and sixty-six were dead.

The procedure is that of a thoracentesis except for the injection of air into the pleural cavity, rather than the removal of fluid. Water in one large bottle is allowed to syphon over into another forcing the air above it out through the tubing and needle into the chest cavity. The amount of air injected can be read on a scale on the bottle as the number of cubic centimeters of fluid run through the syphon. A manometer can be let into the tubing system by stopcocks to show the intrathoracic pressures at any time during the process. To understand the theory a little better, let us look at the anatomy and physiology of the chest. It is divided into two parts surrounded by the ribs and movable diaphragm, and separated by a more or less movable partition, the mediastinum. Each half contains a lung communicating freely with the atmosphere through the bronchi and trachea. When the volume of the chest increases by raising the ribs and depressing the diaphragm if the lung should remain stationary a vacuum or negative pressure would be created between the lung and chest wall. The atmospheric pressure, acting through the trachea, pushes the lung out to overcome the negative pressure, and the result is inspiration. When muscular effort relaxes, the elastic tissue in the lung itself is no longer opposed in its contracting and it forces out the inspired air through the free air passages. If the chest wall and diaphragm remained fixed, another vacuum would obtain between lung and chest wall while the lung contracted. The negative pressure however pulls the chest wall in and diaphragm up and this more passive phase of respiration constitutes expiration. The negative pressure prevents the pleural space from becoming more than a potential one. It is this innate contractility of the lung which is made use of in artificial pneumothorax.

When nature attempts healing of a tuberculous lesion in the lung, the elastic fibers play an important part. Fibrosis initiates the healing process and, as it progresses a certain amount of local atelectasis obtains. With the local atelectasis there is a radiating pull on all the surrounding elastic fibers, which is transmitted to the lung tissue in the vicinity. As a result of this pull the adjacent areas undergo a compensatory emphysema in order to replace the loss of air space, and make up for the decrease in lung volume. The tenting of the diaphragm

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seen occasionally in roentgenograms of tuberculous lungs is considered to be due to this local atelectasis before a compensatory emphysema has taken place.

Where one lung contains much involved tissue this combination of atelectasis and emphysema shows up more markedly. The mediastinum deviates toward the diseased side, with emphysema present in the good lung. In a pneumothorax this atelectasis is forced on the lung from without rather than waiting its nature to do it by fibrosis.

Atelectasis has a systemic as well as a local effect. The circulation through the area involved is cut down with a resulting diminution of absorption from the diseased portion and a consequent clinical improvement. This is the reason for the rapid improvement in patients who are started on the treatment.

Since it is the negative pressure in the chest which holds out the lung anything in the chest cavity to take up some of the space would leave that much less for the lung to occupy when the negative pressure is overcome. This is the simplest statement of the theory. Our time is far too short to consider all the effects on the collapse of the pull of adhesions, mediastinal swing, selective collapse, and other factors which enter into the procedure to make each case an individual problem. It is this complexity of an apparently simple problem which requires control by manometer readings, the fluoroscope and roentgenograms.

Prolonged continuation of the lung collapse will produce characteristic intrathoracic changes. The pleura which is apt at first to be irritated by the air with the development of an effusion especially in the first four months gradually thickens so that effusion is less likely and absorption of the air is less rapid, giving a longer interval between refills. The amount of air absorbed at first is about 85 to 100 cc a day but this will go down to 25 to 30 cc a day after a few weeks. One man I injected had been taking the treatment for several years, and each six weeks when he had his refill, 100 cc made him uncomfortable.

The most characteristic changes of course are in the lung. At first there is only a small degree of collapse and the lobes can be seen under the fluoroscope to be still functioning. As the mediastinum stiffens, and the mean negative pressure becomes less the lung becomes more firm and less aerated until it is a fairly solid mass on the lung root. Cavities in the lung become likewise compressed and on following them with the fluoroscope and chest plates they will of course hold out the adjacent area of the lung and lengthen the time of treatment since they stretch slowly if at all in most cases. Obliteration of cavities favors fibrosis and local atelectasis so that eventually when

the lung can be allowed to expand the cavity has been replaced by a nodule of scar tissue in the ideal case.

Intrathoracic conditions are largely gauged by the manometer even more than by the fluoroscope and various factors influence the readings. The calibre of the needle is important. Other things being equal, a smaller needle will give a lower reading than a larger. Posture of the patient also has its influence. The readings have been found to be higher in the dorsal than the lateral position.

Temperature has sometimes a marked effect. Cold air injected into a patient will raise the reading when it is warmed to the patient's own temperature. I remember one man who had his refill one hot July day. Though told to keep in the shade he knew better. Just before supper we had a hurry call to his cottage. He had been lying on his cane chair in the sun all afternoon and the air had been warmed and expanded. We had to remove some of his air so that the poor fellow could breathe again.

Barometric pressure sometimes has an influence. A rise of five thousand feet in altitude will give about 20 per cent more volume to the same charge of air at sea level. While few patients change altitude so rapidly, it sometimes makes a difference. A patient who was referred to me during the summer was staying in a town about nine hundred feet higher than ours. He told me once that after a refill which had given him no trouble in the office he was acutely uncomfortable that night and the next day. This was undoubtedly the effect of altitude.

The optimum pressure for treatment has always been a disputed question. Forlanini originally advocated high positive pressures to insure immobility of the lung. Murphy of Chicago gave three thousand cubic centimeters of air at the initial treatment but apparently gave no further air. The general practice now is to give enough air to bring the pressure to a slight positive, so that the mean pressure will be a low negative one. By this means the lung will collapse readily without discomfort to the patient and what is more important, there is little if any danger of rupture of adhesions.

Frequently in a tuberculous patient there is a condition of vesiculation in the mediastinum reported in the literature as a small pneumothorax, due to the extravasation of air. The radial contraction of the elastic fibers about the tuberculous lesion forming a path of least resistance for it causes it to work its way along the root of the lung accelerating the local atelectasis. From this phenomenon Morgan developed his idea of selective collapse. In this a small amount of air is given which works its way along the surface of the lung toward the lesion and gives a collapse similar to that in the small pneumothorax. This has the great dis-

advantage that each refill is practically an initial treatment, with increasing likelihood of adhesions due to pleural trauma. A selective type of collapse can be observed, however, in many cases, as the more diseased lobes, unless held out by adhesions, often contract faster than others with more normal tissue, which can be seen still functioning under the fluoroscope.

A treatment of this kind, with its frequent pleural punctures, of course has its dangers. First of these is the so-called "pleural shock", considered by some to be of neurogenic origin and by others to be due to air embolism. If plenty of novocain is used, and the needle is found to be in the chest cavity before injecting air, this danger is not serious. It is infrequent.

Pleural effusion, while common is not usually dangerous. Rupture of adhesions however, with uncontrollable hemorrhage, or discharge of the contents of a cavity, is far more serious. This is usually due to high positive pressures in the attempt to stretch an adhesion, so in this case the manometer should give warning.

Discharge of the contents of a collapsed cavity to infect the contralateral lung by the bronchogenic route, while possible, is less likely to cause such an infection than the constant raising of positive sputum from the uncollapsed cavity.

A procedure with all these dangers must have some advantages to offset them. As the figures quoted above would show, a patient with a good collapse stands a better chance than one without. While not all cases are suited to the treatment, still it has saved many thousands of lives, and restored to usefulness many patients who otherwise would have had to spend the larger part of their lives either in bed or in a state of chronic invalidism.

As examples of the results of the treatment the following may help to show some of the points stressed above.

Miss A, a nurse in New York, became much run down and overtired. She developed a chronic cough which became productive. On examination the sputum was found to be positive for tuberculosis and chest films showed multiple cavitation in one lung with beginning mottling in the other. She was sent to our sanatorium by ambulance and pneumothorax was instituted as soon as possible after admission. At the end of two weeks the cough which had been practically constant on admission was rare, there was only a slight amount of sputum and the temperature was normal except for an occasional slight afternoon rise. A month after admission she had been discharged from the infirmary to a cottage, and was walking to meals. The collapse was maintained fairly completely the cavities closed well and a year after admission she was discharged as arrested to continue her refills in New York.

Mr D a young engineer developed a chronic cough which did not improve. After he began to lose weight and strength, and the cough became

productive the sputum was found to be positive, and chest plates showed a large apical cavity on the left side. He was put on complete bed rest, but as improvement was not marked pneumothorax was started. A series of chest plates showed the large cavity becoming progressively smaller, and a hand adhesion over it to the apical chest wall could be observed stretching and becoming narrower. His general condition improved in direct relation to the closure of the cavity, and the cough practically ceased the sputum stopped and he had a steadily normal temperature. He was sent to me for refills during the summer and is still receiving the treatment but should be able to resume his work soon.

Mrs M a young housewife a former nurse developed a pneumonia about the end of 1934 from which she recovered except for a chronic cough. Six months later her condition was worse and she spent seven weeks in a hospital. At that time the sputum was found to be positive chest plates showed disease in the right lung. Home treatment was attempted but after a summer spent in a bathing suit the cough and sputum were still present and her general condition continued to become worse. Chest plates taken during that fall showed beginning cavitation in the right lung with some involvement of the left also. She was continued on bed rest and was finally referred to me for a pneumothorax. In spite of the cavitation in the right lung only one adhesion at the apex was found to be holding it to the chest wall and a good collapse was initiated. She was treated in the hospital until arrangements could be made for her to go to a sanatorium. While the first two or three treatments gave her a little discomfort she had no further trouble from the injections. Her general condition improved almost miraculously the cough ceased sputum was limited to an occasional slight morning expectoration and her temperature stayed consistently normal. Before she left for the sanatorium chest plates showed the cavities becoming smaller and the disease in the opposite lung was apparently improving. Her ultimate prognosis is now good although she will have to continue the treatment for several years.

These cases and many similar ones, all speak for the efficacy of artificial pneumothorax as a therapeutic measure. Until a specific attack can be made on the causal organism in tuberculosis, this type of treatment will undoubtedly remain well to the fore in the armamentarium of medicine's fight against pulmonary tuberculosis, due to its relative simplicity, and great effectiveness in suitable cases.

#### DISCUSSION

PRESIDENT ARBOTT: Discussion on this paper will be opened by Dr Robert B Kerr of Manchester.

DR ROBERT B KERR: Dr Spring and this Society are to be congratulated upon this most comprehensive and enlightening exposition of a very important and timely phase of treatment of tuberculosis. This paper is particularly timely in view of the widespread interest in and increasing utilization of pneumothorax treatment of the disease. The increasing use of pneumothorax has assumed sufficient proportions and achieved results which warrant the belief that this form of collapse therapy has a permanent place in the treatment of carefully selected cases of tuberculosis.

Dr Spring's presentation of the subject impressed

me particularly because of the spirit of conservatism displayed throughout its entirety, for I feel that not all cases are suited to this form of treatment and as Dr Spring points out 'pneumonia in tuberculosis presents different aspects in each patient so that each case must be judged on its own merits or perhaps we should say demerits

Dr Spring has presented a splendid outline of the indications contraindications dangers results and technics of pneumothorax There is but little that I can add to this valuable paper

I well remember my first introduction to artificial pneumothorax It was in the early summer of 1914 I had learned that Dr Balboni of Boston was carrying out this form of treatment upon ambulatory tuberculosis cases at his office on Blackstone Street in the market section of Boston I visited Dr Balboni witnessed his carrying out of artificial pneumothorax upon several cases and was much impressed by his enthusiasm Dr Balboni had recently returned to Boston from a visit to his native land Italy where he had met Carlo Forlanini—learned of his work with pneumothorax—studied its technic and brought back with him a pneumothorax apparatus Previous to this this method of treatment had been instituted in this country by Tice and Murphy Although the procedure seemed to be successful in the hands of these men it was not generally adopted and it had waned with occasional spurts of interest and enthusiasm until with in the past five or ten years Undoubtedly the development of the x-ray in diagnosis and follow up study of the chest combined with efforts of an enthusiastic group of chest surgeons has revived interest in pneumothorax with most encouraging results

It is well known that artificial pneumothorax should not in any sense be considered a cure for tuberculosis It is simply an adjunct to the routine bed rest hygienic and dietetic treatment.

The cure of tuberculosis has only been achieved when the diseased lung tissue has been absorbed or fibrosed The results of pneumothorax treatment cannot therefore be fully evaluated until after the compressed lung has re-expanded Then the physical examination and x-ray evidence can be studied to demonstrate whether the cure of the pathology has or has not occurred Pneumothorax treatment can not be said to be fully successful until it can be demonstrated that absorption or fibrosis of the tuberculous process has resulted and this result is evident upon re-expansion of the lung

Artificial pneumothorax has come into wide use and unfortunately the risks and dangers of it are not generally realized The technic is simple but requires the utmost precision and thorough knowledge of pulmonary tuberculosis Various degrees of collapse can be maintained The success of this form of treatment is dependent upon the degree of the collapse achieved It has been demonstrated that the more complete the pneumothorax the more successful the results The fluoroscope and x-ray now are of inestimable value in outlining the degree of the collapse and hence enable the physician to make this form of treatment more successful

The proper selection of cases for pneumothorax treatment imposes upon the physician a most serious responsibility

The tragedy of the contralateral lung is too frequently a source of keen disappointment and chagrin The disappointment is most keen in these cases where a formidable disease process has been brought under control perhaps brilliantly and then unheralded and many times with dramatic suddenness there appears an acute spread in the contralateral lung This is particularly true when the contralateral lung was shown by all the means at

our command to be free of disease The presence of an already existing lesion in the 'good lung' imposes upon the physician in charge the necessity of exercising sound judgment and meticulous caution particularly when it is remembered that approximately thirty to forty per cent of all pneumothorax procedures are followed by pleural effusion This sound judgment and meticulous caution can accrue only from a wide experience and a basic intelligence To overlook the presence of a contralateral lesion and the failure subsequently to evaluate its potentialities cannot of course be condoned Suffice it to say that occasionally in the fervor of organizing the attack against an extensive disease, it happens The aggravation and at times devastating spread of this lesion may follow the application of unwise perhaps too radical collapse measures upon the diseased side When a lung is collapsed partially or totally there is imposed an added burden of function upon the opposite lung The opposite lung then has to carry on in great part the respiratory load It is obvious therefore that the integrity of this lung could be definitely and decidedly threatened did it contain a diseased process

With the advent and during the earlier days of pneumothorax treatment a nominal lesion in the contralateral lung was considered the limit of safety Anything more than this portended grave danger and contraindicated pneumothorax treatment

A perfectly clear lung was preferred Today with a wider experience with the application of low tension selective collapse and perhaps augmented by a bolder attitude many more liberties are taken and certain types of cases with bilateral disease are being given pneumothorax But there is always a decided uncertainty in these cases In the consideration of the proposed collapse procedure for the bad lung just how little or how much will the contralateral lung stand just how slight or extensive a pathologic involvement will it permit?

To answer these questions is frequently quite difficult and the solution of the problems raised demands experience judgment and intelligence Even then too often failure proves the error

As Dr Spring has stated each case studied for pneumothorax should be judged on its merits or perhaps we should say demerits

PRESIDENT ABBOTT This paper will now be discussed by Dr Robert M Deming of Gloucester

DR ROBERT M DEMING I have greatly enjoyed hearing Dr Spring's paper and feel that congratulations are in order since this paper received the Pray and Burnham prize for this year

Several thoughts relative to artificial pneumothorax occur to me The aim of any collapse procedure is to produce the greatest amount of lung rest with the least possible amount of physiologic derangement and the smallest possible ratio of permanent impairment either functional or anatomic Understanding that the lung expands and contracts at least twenty five thousand times in a twenty four hour period and knowing that bed rest alone will but slightly lower this rate of movement the reason for an air splint or pneumothorax—a simple procedure—seems obvious

There are some men in tuberculosis work as in any other field of endeavor who become enthusiastic about everything and anything at one time or another and consequently either overdo or underdo and criticize their results accordingly Pneumothorax has been used by some at some time for all cases regardless of the amount of lung involvement not used by some at any time and used in selected cases by others It rightfully belongs in selected cases only although there are some con



ditions where anything is worthy of a trial regardless of the classical indications. Pneumothorax as Dr. Spring well states is not a 'cure-all' for pulmonary tuberculosis, but given equal indications and conditions it is the primary operation of choice.

To Dr. Spring's indications for its use I must add, and strongly emphasize, the finding of positive sputum as the number one indication. Placing this first in any classification does not actually imply priority of indication or greater suitability. It merely serves to affirm the conviction that the positive sputum in itself, given the conditions, is sufficient indication for any procedure which may prove adequate to its conversion. Conversely the conversion of sputum from positive to persistently negative following pneumothorax treatment is rather proof positive of its usefulness from a clinical standpoint.

It is a simple procedure but properly to protect the patient and ourselves from being respectively overdone and overdoing, routine x-ray plates and occasional fluoroscopic examinations should be available and used.

At the Sanatorium at Glenciff we have been doing pneumos for about nine years have performed around seven thousand initial and refill operations, and are averaging now around twenty per week. Approximately 60 per cent of our patients are receiving or have received some form of collapse therapy during the past four years. Of seventy-five individual patients on whom pneumothorax was attempted during the past two years fifteen were unsuccessful due to no space being available or pleural adhesions being present to such an extent that a satisfactory collapse was not possible. I might add that whereas originally it was felt that a complete collapse with strong positive pressures was essential we now use negative pressures for the most part and are reasonably content if but a partial collapse if more or less selective results.

More and more I am inclined to consider pneumothorax in the late moderately advanced cases even though unilateral as a more or less experimental procedure to determine the effectiveness of collapse therapy. If successful that is if the sputum is converted I doubt very much if the lung will fully re-expand, and again there arises the question whether it is wise to allow it to re-expand because of the possibility of the healing of the scar tissue being broken. I am inclined to believe that in these cases a permanent form of collapse should be very seriously considered.

Of seventy-six patients during the past two years for whom pneumothorax was indicated those strictly unilateral or those who had predominantly unilateral lesions, the following figures may be of interest in comparison with those given by Dr. Spring. For fifty-five patients pneumothorax could be given with a successful result from a technical standpoint. Of this number twenty-six or 34.21 per cent were apparently arrested and clinically well, seventeen or 22.38 per cent were improved, eight or 10.54 per cent were unimproved, four or 5.26 per cent were dead. Of the twenty-one for whom pneumothorax was indicated but for whom for various reasons it could not be carried out, four or 5.26 per cent were apparently arrested and clinically well as compared with twenty-six in the above statistics, four or 5.26 per cent were improved as compared with seventeen, five or 6.57 per cent were unimproved as compared with eight, and eight, or 10.53 per cent were dead as compared with four in the preceding figures.

While the purpose of all treatment is to get the patient home, no longer a menace to himself and his associates and able to be gainfully employed, the collapse therapy if successfully introduced will

allow the patient to continue treatment at home and so, not only relieve congestion in the Sanatorium but make him happier and more contented. One difficulty in New Hampshire is that there are only a comparatively few men prepared to give 'pneumos' and they are somewhat scattered around the State and secondly, financial distress has made necessary routine x-rays and fluoroscopies most difficult for the average tuberculosis patient to arrange for. I have high hopes that an increasingly larger number of physicians will qualify themselves to give pneumothorax treatments be prepared to give them at a nominal fee, and that through them equitable arrangements for routine x-rays may be arranged.

PRESIDENT ABBOTT: The paper is now open for general discussion.

DR. FOSTER of Manchester: I was very much interested in this paper covering the treatment phase of a disease so prevalent among the inhabitants not only of New Hampshire but of the entire country.

There are three or four points relative to this that I thought perhaps had been overlooked or had not been brought out emphatically enough.

Back in 1908 I was attending a clinic at St. Luke's Hospital in Chicago. Dr. John B. Murphy had just then brought out his apparatus for artificial pneumothorax. I became interested in it and took one home and have been using it sporadically since 1909.

I find that the technic of introducing the trocar needle into the pleural cavity is a very important part of the treatment and that a great deal of damage can be done if this technic is not properly carried out. The sensation brought to the finger tips by repeatedly doing this is the guide. This damage can be greatly emphasized when done in cases where there are colonies of active ulcers.

I also feel that the treatment should never be given in the presence of active hemorrhage. These cases should be put at rest and remain so until the hemorrhage has become quiescent, for at least one month.

I still feel that nitrogen is the sort of gas to use, not air, not oxygen, but nitrogen. It will last longer and will do the work much better, and in the presence of adhesions it certainly serves as a much better and more effective part of the treatment of this disease.

I also feel that the amount of gas injected should be carefully watched, perhaps 25, 50 or 75 but not more than 100 cubic inches at any one time.

This treatment is nothing new for tuberculosis. It has been used successfully for a long time and has been effective in properly selected cases. I think at the present time we are overdoing the surgical treatment of tuberculosis anyway, but here is a thing that may exert a very strong as well as a favorable influence in the treatment of tuberculosis. However it has to be safeguarded in its technic and in its performance.

PRESIDENT ABBOTT: Is there any further discussion on this paper?

DR. LOUIS AGER: I think it is about twenty years since I did a pneumothorax. I did a few at that time and then stopped.

We used nitrogen at that time but I am not aware that it is used at present. It was rather a crude operation then.

At that time there was not much choice or knowledge of what cases were suitable for pneumothorax. We were trying to cure cases which it would be absurd to treat in this way nowadays and we didn't know at the time that the air was going to escape again when we got it in. This is particular



ly true with children which renders it rather a hopeless procedure in such cases. But there are occasional cases of the adult type of tuberculosis in children in which it may be beneficial.

The reader of the paper gave us the technique but didn't go into other points very much. As Dr Foster said I feel very strongly that there is a tendency at the present time to overdo the surgical treatment in tuberculosis. Dr Alexander over at Saranac a year ago frightened everybody when he said that they were not treating tuberculosis because they were not using surgery. I don't agree with that at all. It is a selective procedure and even in your general practice and in your state and private sanatoria will see many cases in which it is a highly unnecessary treatment.

A fact which I believe was very encouraging was the statement that more men should be encouraged to carry on this procedure in New Hampshire. Early diagnosis is the essential thing and the treatment in the early stages, in a large majority of cases should not require pneumothorax.

Dr Foster made one statement that rather astonished me that pneumothorax was contraindicated in hemorrhage. It is the one and only successful treatment I know of for severe hemorrhage.

PRESIDENT ABBOTT I am going to call upon Dr Spring to close the discussion on his paper at this time.

DR. JOHN D. SPRING There are various things of course that we could not bring out in a paper the length of this one. Really to discuss this and go into detail about the matter wouldn't leave time for any other speakers at this meeting of ours. So we had to cut it down somewhat. Consequently there are a great many things that have been left out.

Dr Kerr said that not all cases are suitable for this type of treatment. You have to use your own judgment with each particular case and sometimes when you think a case is a good one for treatment you may find yourself in error afterward.

In the particular case whose slides were shown we were doubtful at first due to the amount of disease in the lung as to whether we would be able to get any air into the chest but we were fortunate in being able to collapse that lung fairly well. Incidentally according to the last report of the sanatorium she has gained twelve pounds since she left us apparently the treatment isn't doing her any harm or maybe she is getting more to eat.

As Dr Kerr said the adoption of this type of treatment has been slow. It goes back to 1822 when Carson first thought about it in a constructive way. He did try it on one case and did it by cutting down onto the pleura and trying to let air in. He was very unfortunate in the case he happened to choose and in the place he selected for the operation in this patient and wasn't able to get any air in because the lung was tied down tight. So the adoption of this method has been very slow.

Forlanni studied it in 1882 and did his first cases in 1888 and reported them in 1894.

Morgan thought about this problem in 1913 or 1914 but it wasn't until ten years later that it was being done.

When I was first doing this out at Loomis that was one of the two or three sanatoria in the country where much of it was being done. There was one place out in California where it was fairly well used and then in our place we were doing in the whole sanatorium around fifty to seventy five a week. They do it a lot more there now but of course all of these patients have to be selected cases. You can't apply it to all of them.

In the case of disease in the contralateral lung as far as I have noticed in all of these cases I have ever seen if they have contralateral disease and a good collapse can be obtained in the worse lung the other lung very often will improve of itself and even if it doesn't, sometimes fairly good results can be obtained from a bilateral treatment where both lungs are given small amounts of air alternately so as to give a moderate amount of selective type of collapse which you noticed there in the slides where one of the lobes came down pretty well and the other was working. In such a case these patients would very often do fairly well on small collapses in both lungs when given alternately.

As Dr Deming has said positive sputum is a good indication. In fact it is a primary indication because you usually find the positive sputum in these cases which are good ones for the treatment anyway. It is a lot handier for the patient, particularly if he has to pay his way in the sanatorium to go home with his lung collapsed and held down by refills than it is to stay at the sanatorium and pay \$25.00 a week or whatever it happens to be. So that if he can go around to the sanatorium every week or ten days or two weeks and have a refill for \$5.00 it is much more convenient for him.

Dr Foster spoke about technic. Technic is a whole volume in itself. There is a type of needle which is used for introduction of the air and it is much better than the usual Wassermann or spinal needle which is sometimes used. The Floyd needle is a Y shaped piece of apparatus with a piece running down through the center and has a fairly shallow or blunt bevel that needle can be used very successfully in the initial treatments where the skin and muscle down to the pleura are well infiltrated with the novocain and then the skin is nicked with the point of a scalpel. This needle can be introduced and as it goes through the pleura the click can be felt. As it punctures the parietal pleura it tends to go only through that and not through the lung pleura which will be shoved ahead of the needle. If you feel that go through holding the needle in your fingers you can stop your needle from going farther and then inject a little air. Then try it with your manometer to make sure you are in the pleural space.

Of course if we wanted to go into the technic in detail that would be a long job.

The frequency of refills of course depends upon the amount of absorption that the patient will carry out. We usually find that at the start these patients should be given air every two or three days it can be cut down finally so that they are getting it every week every ten days or every two weeks. Giving a patient air every two or three months sometimes allows him to absorb too much and the cavities will tend to expand. Then all your good work will be wasted.

The use of nitrogen is a question. It costs more than ordinary air which we can gather from the surrounding atmosphere without any trouble.

There is a recent article which I noticed in some German magazine in which the author gave tests of the pleural contents in several cases of pneumothorax that had been having nitrogen others that had been having air and some that had been having various other gases. After this air or gas had been in for a certain length of time the oxygen in the air had absorbed or in the case of the nitrogen a certain amount of oxygen had been accumulated in the pleural cavity. The end result in these patients is all the same in the proportion of gases. So the use of nitrogen is all right if you wish to pay for it. However very often it doesn't work any better.

We do have to watch the amount injected, because if you give these patients too much, frequently they will have a lot of pain particularly at the apex of the mediastinum, where there is a certain lateral pull on it from pressure. Some times particularly in the early cases, that is very painful to these patients.

Sometimes, there does seem to be a little too much

surgery in tuberculosis, but here again, we have to use judgment in the selection of these cases. Not all of these cases, by any means, are good ones for a pneumothorax. Sometimes, if we think they are doubtful, it doesn't do any harm to give them the benefit of the doubt, and try air on them to see if they will collapse because their chances, statistically, are a little better.

## SEXUAL STERILIZATION IN NEW HAMPSHIRE\*

BY SIMON STONE, M.D.†

THE problem of eugenics and eugenic sterilization has for some time attracted much attention in the United States and abroad. In Germany especially, where for political and social reasons sexual sterilization was proclaimed to be a panacea for the prevention of mental disease in future generations, it has been carried to extremes, both in practical application and in theoretical speculation on expected results. In England, a committee appointed for the study of the subject (British Departmental Committee for the Study of Sterilization) decided in favor of eugenic sterilization in selected cases, but suggested that the law be voluntary rather than compulsory. The present state of knowledge of inheritance of mental disease, members of the committee felt, does not warrant passage of legislation which will produce hardship on a large number of individuals, as it does in Germany, without actually producing any definite diminution in the incidence of mental disease in the future.<sup>1</sup>

In Canada, the Sexual Sterilization Act of Alberta was passed in 1928 (the first of its kind in the British Commonwealth) and provided for the sterilization of certain inmates in mental hospitals. Consent of the patient, parent or guardian is required before the operation can be performed. Besides, in order to safeguard against abuses, every case must be passed upon by a special board appointed for this purpose. Over 200 patients were sterilized during the first five years following its passage.<sup>2</sup>

The first bill for eugenic legislation in the United States was introduced and defeated by a small margin in the Michigan legislature in 1897. The first compulsory sterilization law was passed by the state of Indiana in 1907, but the statute was not put into active execution for a number of years. Ten years before the Indiana law was passed, Dr. Harry C. Sharp<sup>3</sup> of the Indiana State Reformatory performed surreptitiously the first vasectomy for the sterilization of an inmate of the school. He sterilized thus a number of inmates and should be credited with having been the first to utilize this operation for sterilization purposes.

Twenty-eight states in the Union have now on their statute books laws permitting sexual sterilization in selected cases. In several other states legislation is pending for the legalization of such procedure. The laws themselves and the force with which they are executed vary in the different states. In California, as a result of the efforts of several interested individuals, the law has been carried out to its maximum degree and up to the present over 10,000 sterilizations have been performed on patients in institutions or on individuals at large since its passage in 1909. In several states, where legislation permitting sterilization has been in force for a number of years, not a single sterilization has been performed as a result of laxity in taking advantage of the law. In the majority of states the law has been functioning moderately. At the end of 1935, over 23,000 sexual sterilizations of which records are available, had been performed all over the country, although probably many more operations have remained unrecorded.

Sterilization laws in New England have been passed in Connecticut, New Hampshire, Maine and Vermont. The first law in Connecticut was passed in 1909 and re-enacted in 1918. By the end of the year 1931, a total of 158 sterilizations were performed in the state. In 1925 the first law was enacted in Maine and re-enacted in 1931. The Vermont law was passed in 1931 and, in Rhode Island, legislation is still pending. In New Hampshire the first sterilization law was enacted April 18, 1917. It was amended April 14, 1921, and re-enacted April 18, 1929.

The movement for eugenic sterilization in New Hampshire received its original stimulus through the work of Dr. Charles P. Baneroff, Superintendent of the New Hampshire State Hospital from 1882 to 1917. For some time, he had felt that the subject of inheritance of mental disorders required more careful study and more attention than it was then receiving in state institutions, the logical places for such research. He obtained the service of trained investigators and succeeded in obtaining many data in regard to the heredity of certain patients, which he later used for the purpose of sponsoring satisfactory legislation in regard to sexual sterilizations. His discussion of his aims,

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as revealed in his annual report for the year 1912 is interesting. He wrote as follows: "In insanity on the other hand not one but many causes contribute to the development of mental illness. Prominent among these causative factors stands heredity. But heredity is not the single entity that one might at first think. For by heredity we need not necessarily mean some previous mental disturbance in some nearby ancestor. Heredity must be a much more inclusive factor than that. Alcohol in the ancestry, instability of the nerve structure showing itself in emotionalism, hysteria, St. Vit dance and even retarded action of the nervous system exhibiting itself in dullness and stupidity, degeneracy and feeble-mindedness all enter into the protean complex which we recognize as heredity. The study of the causes of insanity, especially of the hereditary beginnings of the disease becomes therefore, most vital to us if we propose to diminish its prevalence in the community. For this reason the field work which has been somewhat tentatively begun during the last year, assumes much importance. The field worker penetrates the remotest corners of the state, investigates the hereditary antecedents of the patients, studies the environmental conditions, searching out all contributory factors leading up to the mental outbreak in this individual case and then carefully charts and tabulates the data. It is to be hoped that such detailed investigations carried out over a series of years will so illuminate the antecedents of insanity that society will be enabled thereby to accept some measures looking toward intelligent prevention."

The end-results of this study culminated in the passage of the first New Hampshire sterilization law. The original law was voluntary in nature and provided for the sterilization of the feeble-minded and patients suffering from certain types of mental diseases in institutions and at large with the patient's consent when able to do so, or with the guardian's approval otherwise. Fifty-five patients were sterilized under the old law (1917-1929)—fifteen at the Laconia State School and forty at New Hampshire State Hospital.

On April 18 1929 the law was modified and the voluntary clause of the previous law was removed. The new law states that "whenever the superintendent of any state or county institution shall be of the opinion that it is for the best interest of the inmate and of society that any inmate of the institution under his care should be sexually sterilized, such superintendent is hereby authorized to cause to be performed by some capable surgeon the operation of sterilization on any such inmate confined in such institution afflicted with hereditary forms of insanity that are recurrent idiocy imbecility, feeble-mindedness or epilepsy." The law re-

quires that the inmate be examined together with the history and record by two physicians, who are registered in the state, of two or more years' practice and in no way connected with such institution or related to the patient. Their opinion together with the superintendent's is to be forwarded to the county commissioner or to the governing board of the institution. A copy of this decision is to be served upon the inmate and his guardian fourteen days before the board meets. The guardian or the inmate is given an opportunity to attend the hearing and voice objection to the operation before the board.

If the board decides that the inmate is insane, idiotic, imbecile, feeble-minded or epileptic and by the laws of heredity is the probable potential parent of socially inadequate offspring likewise affected, that the inmate can be safely sterilized without detriment to her or his health and that the welfare of society will be promoted by this sterilization, the operation can be carried out after an interval of thirty days—stipulating that nothing in this act shall be construed to authorize the operation of castration or the removal of sound organs from the body. The family or guardian is permitted to appeal to the Supreme Court within fourteen days of the time the order was issued.

Since the law was amended 255 new sterilizations have been performed. Of this number 115 were performed at the New Hampshire State Hospital, 91 at the Laconia State School for Feeble-Minded and 49 at the various county farms in the state. A total of 310 sterilizations have been performed since the original law was passed in 1917. Half of this total or 155 operations were performed at the state hospital, 106 at the Laconia State School and 49 at various other hospitals. Forty-four of the operations were performed on males, the number divided equally between the state hospital and the state school and the other 266 sterilizations on females. So far the law has not been challenged in court.

#### DISTRIBUTION OF THE CASES

The largest number of sterilizations as evidenced from the figures above have been performed in state controlled institutions. Of the total sterilizations performed in county institutions nearly half (22) were performed in one single county and no sterilization operation has ever been carried through in half of the counties of the state. The initiative displayed in taking advantage of the law varies much with the county authorities. As one social worker observed it was not always the lack of financial means that prevented the operation from being recommended in some county institutions. Frequently the objections were religious and moral, although the usual apologies of crowded conditions in the county hospital were offered as an

excuse. When the issue was brought up again before the county authorities, it was usually sidestepped and in such instances, the facilities of the state hospital or state school had to be used.

In a reply to a questionnaire sent out to the superintendents of the various county institutions in regard to the reasons they found that warranted them suggesting the operation, the following answers were obtained. One wrote, "Besides the cases already covered by law, also where the husband and wife, due to economic conditions, request the operation, feeling that they are unable to assume further responsibility." "In cases where there are large families without sufficient means, in cases of incorrigibility and illegitimate children," were the reasons given by another county executive. "In all females with a sexual history back of them who are admitted to any institution supported by the taxpayer," was given as a reason in another county. According to the replies to the questionnaire, all patients sterilized in the county institutions were able to leave the institutions after the operation.

In the School for Feeble-Minded in Laconia where 106 sterilizations have been performed Dr. B. W. Baker, the superintendent, has summarized succinctly the following reasons for carrying out the operations on selected inmates of the school. The operation is suggested "in those in which family history indicates potential transmissibility of hereditary defect or disease, in those capable of self-support if unhampered and in those having families, who will support them. Briefly, those who can, if excused from child-bearing, care for themselves enjoy greater social freedom and excuse the state from their support and from the support of their defective offspring."

Of the 106 cases sterilized at the state school 86 were discharged from the school, 13 are on parole, and 7 still remain in the institution. Lack of funds, Dr. Baker states, makes it impossible for him to recommend the operation in many more patients for whom he thinks it is indicated. If these could be performed, a larger number of patients would be given parole privileges and also better opportunities for obtaining jobs after their discharge from the school.

The first sterilization operation in the New Hampshire State Hospital was performed on February 29, 1916, on a mentally deficient patient with her own consent for the operation. Since then a total of 154 sterilizations have been performed—132 on females and 22 on males. Forty patients have been operated on under the old "voluntary" statute (1917-1929) and 114 patients since the new law went into effect. The following table gives the number of operations performed each year since the first opera-

tion was carried out of which a record is available.

TABLE 1  
YEARLY NUMBER OF OPERATIONS PERFORMED

1916	1	1926	2
1917	0	1927	2
1918	1	1928	7
1919	4	1929	0
1920	0	1930	19
1921	5	1931	20
1922	7	1932	20
1923	1	1933	8
1924	6	1934	33
1925	4	1935	14

The operations consisted of 132 salpingectomies, 22 vasectomies and 2 orchidectomies, the latter 2 operations having been performed following the vasectomies at the patient's request and with the family's consent.

The age of the patients extends through the entire reproductive cycle. Five patients sterilized were below the age of 15 and one patient was over 45 years old at the time of the operation. In the younger patients and in those above the reproductive age, a definite indication for the operation was found at the time of the sterilization by the examining physicians.

TABLE 2  
AGE GROUPS OF STERILIZED PATIENTS

Age	Female patients	Male patients
11-15 years	5	0
16-20 years	23	4
21-25 years	30	8
26-30 years	27	7
31-35 years	34	0
36-40 years	8	1
41-45 years	4	1
46-50 years	1	1
Total	132	22

Following the operations, 87 out of the 154 patients sterilized were able to leave the hospital in a recovered or improved condition. As seen from table 3, the percentage of discharges varied with the diagnostic subgroup. As usual, the largest number of mentally deficient individuals without psychosis were able to leave the hospital. Of this group, 70 per cent are out of the hospital, making a satisfactory adjustment with or without supervision. In the psychotic groups, 19 out of 23 manic depressives are out of the hospital, also more than 50 per cent of the catatonic schizophrenics were able to leave. As can also be seen, the mentally deficient group with 51 patients makes up one third of the number sterilized and the schizophrenic group nearly another third.

TABLE 3

DIAGNOSES OF STERILIZED PATIENTS, AND NUMBER REMAINING IN AND DISCHARGED FROM THE NEW HAMPSHIRE STATE HOSPITAL

Diagnosis	Total	In	Dis- charged
Paresis	5	3	2
Psychosis with other somatic diseases	3	2	
Psychoneurosis	3	2	
Psychopathic personality	6	6	
Paranoia	1	0	
Epilepsy without psychosis	9	4	
Epilepsy with psychosis	5	3	
Involution melancholia	2	1	
Mental deficiency without psychosis	32	11	1
Mental deficiency with psychosis	19	10	
Manic depressive manic	19	4	10
Manic depressive depressed	4	0	4
Dementia praecox, catatonic	33	16	17
Dementia praecox paranoid	6	3	
Dementia praecox hebephrenic	5	2	3
Dementia praecox simple	2	0	2
Total	154	67	57

## HEREDITARY FACTORS

A review of the family histories as obtained from the records and other sources gave the following data in regard to the various diagnostic groups that were sterilized at the New Hampshire State Hospital.

Out of a total of 51 mentally deficient patients, in 36 a definite family history of mental deficiency or psychotic episodes was found in either the patients' antecedents or other members of the family. In 7 instances the family history was unknown and in 8 cases the family history was recorded as negative by the admitting physicians. Chronic alcoholism in 1 or more parents was noted in 8 cases, and, in 15 patients, mental deficiency was recorded as having been found in siblings. In 8 instances frank psychoses were reported. Two of the patients had parents who were syphilitic, but the patients themselves exhibited no signs of syphilis. One patient in this group was a congenital idiot. A psychotic hereditary history was found twice as often in patients diagnosed mental deficiency with psychosis as in those without a psychosis. In one instance a mother and her daughter were both sterilized, the mother after she had given birth to 2 children, both feeble-minded.

In the dementia praecox catatonic group a psychotic history was found in other members of the family or antecedents in 8 out of the 33 cases. Alcoholism in the parent was reported in 2 cases. The family history was reported as unknown in 8 cases and as negative in 15 cases.

In the paranoia and paranoid dementia praecox groups, only 2 out of 7 cases reported a negative family history. In one case suicide

occurred several times in the family and frank psychoses have been reported in other members of the family. One sterilized patient and her mother suffering from a similar psychosis, are confined at present in the hospital.

In the hebephrenic group a positive family history was obtained in half the cases.

Of the 23 manic-depressive patients a psychotic family history was obtained in 4 cases, alcoholism in one or more parents in 2 cases, a negative family history in 10 cases and unknown history in 8 cases.

In the epileptic group a history of epilepsy mental deficiency or psychosis was obtained in 50 per cent of the cases. In 3 cases the family history was unknown.

A negative family history was found in the 5 paretics sterilized.

## SEX HABITS OF FEMALE PATIENTS

Seventy of the 132 female patients sterilized were married, 5 were divorced or separated at the time of the sterilization and 57 were single. Among the single patients sexual delinquency and illegitimacy were most frequently found in the mentally deficient group. Nine out of 25 single mentally deficient females gave birth to a total of 15 illegitimate children. There were 3 mothers of illegitimate children reported in the 10 epileptics and a similar number among the catatonics. Out of 3 single manic-depressives sterilized, one case of illegitimacy was reported.

Table 4 gives the number of children born before operation to each married patient arranged as to major diagnostic groupings.

TABLE 4

NUMBER OF CHILDREN BORN TO MARRIED PATIENTS

Diagnostic group	Total sterilized	Number of mothers	Total children born	Average children per mother
Mental deficient	16	13	54	4.2
Schizophrenics and catatonics	17	15	43	2.9
Hebephrenics	4	3	12	4.0
Paranoids	5	5	16	3.2
Simple dementias	2	2	6	3.0
Manic depressives	17	15	52	3.5
Paretics	2	2	7	3.5

The average number of children given birth to by each sterilized married patient before the operation was 3.4.

## SELECTION OF PATIENTS

The selection of patients for sterilization in mental hospitals is by no means a simple procedure if both the rights of the patient and the rights of society are to be safeguarded. About 50 per cent of the patients admitted to mental hospitals are within childbearing age.

Too liberal interpretation of sterilization laws and too drastic attempts at their execution may result in the law being so applied as to include nearly half of the total hospital admissions as cases suitable for sterilization. As a matter of fact, if closely analyzed in the light of our present actual knowledge of genetics and eugenics, only a very small number can be set apart as certain parents of socially inadequate offspring, providing that unsatisfactory environmental factors are not considered in themselves as a reason for sterilization. There stands out, however, a certain group where the operation is definitely indicated for other rather than strictly eugenic reasons. The married woman who has given birth to several children and broken down mentally following every childbirth, even with a temporary, fleeting attack, should not be exposed to future dangers of conception any more than a patient suffering from tuberculosis or heart disease. Again, the married insane patient who is able to go home for a visit occasionally with her husband for indefinite periods and whose abilities to make permanent adjustment outside are limited, should also be sterilized as a prophylactic measure to prevent impregnation during any of her visits home. The runaway patient, whose sexual proclivities expose her frequently to the danger of becoming impregnated, would be much less of a problem to the institution after having been sterilized. This would include also the cases where a large family already demands the attention of a patient who has broken down mentally once where another child would be an extra financial and mental burden and where the occurrence of another pregnancy would appear as a calamity. For the chronic alcoholic patient whose wife is unable to resist his advances during his states of intoxication, for the paretic (treated) and for many others this operation is indicated primarily for other than eugenic reasons.

Excluding the cases mentioned above where the needs for sterilization must be individually analyzed in every patient, universal application of the law to all patients in the hospital is only going to entail hardship and really unnecessary operations on many without benefiting society. At the same time it would cause additional expense to the state which already finds the budget of the mental hospitals a great burden.\*

The cost to the state of sterilization of a female patient including the examining physicians and surgeons fees the appointment of a legal guardian operating room expenses and other details is seventy five to a hundred dollars. If this operation is to be widely recommended as a prophylactic measure it is to be widely recommended as a prophylactic measure so as to prevent impregnations in patients who during an occasional visit home will be exposed to masculine company. The same results could be attained through liberalizing our abortion laws to permit dilatation and curettage operations in cases where the question of impregnation does arise. The fear of an operation would act as a check against promiscuity while sterilization would in many instances re-encourage sexual liberty after the fear of conception has been removed.

## ILLUSTRATIVE CASE REPORTS

Many feeble minded patients are yearly discharged from mental hospitals back into the community. Rehospitalization is often a necessity in some because of failure to adjust themselves satisfactorily outside. Some contract marriage and give birth to children during their absence from the institution, the children in their turn frequently requiring institutional care. Sterilization of such individuals, especially those who are dependent upon the state for their maintenance within and outside the institution, should be considered as a beneficial measure both for the patients and society.

The following case history illustrates this group of patients. Mother and daughter, both mentally deficient, are at this hospital at present. The daughter was born shortly before the mother was sterilized and has since undergone the operation herself.

CASE No 11867 Female—aged 45 (at present) Diagnosis—mental deficiency without psychosis F H—Father intemperate 1 brother mentally defective. The patient had given birth to 2 children at the time of the sterilization which took place at age of 26. Since then she has been discharged and re-admitted on four different occasions. If not for the sterilization performed 19 years previously this patient would probably have given birth by now to a large family. This patient's daughter who is also mentally deficient and psychotic, has also been sterilized recently. A history of promiscuity was also obtained in her case before admission to the hospital.

Before fever therapy was instituted in neurosyphilis, patients suffering from general paresis rarely left the hospital in a much improved condition. Since then however, with the advance of our modern methods of treatment, 20 to 40 per cent of our treated cases of paresis are able to leave the hospital and return to their families with the course of the disease partially or completely arrested. Out of this group, even following active treatment, many patients never return to their former intelligence level, nor are they able to reach their former earning capacity. Advice as to the use of contraceptives, where the conception is to be avoided for eugenic and social reasons, is frequently useless because of the patient's or the spouse's low intelligence. Oftentimes one encounters a history of several living children plus several miscarriages in the family. Sterilization in such instances would be fully indicated and should be carried out more often. Such a situation is illustrated in the following case history.

CASE No 17581 Female—aged 35—married Diagnosis—general paresis F H—Negative. The patient is of low mentality and her husband is of the same mental level. She has given birth to 4 living children and 1 stillbirth and has had 6 miscarriages. The living children are being cared for in an orphanage. A history of sexual promiscuity was also obtained in her case before admission to the hospital.

curt became prominent with the onset of the mental symptoms. The patient has received malaria and intravenous therapy with definite improvement in her condition. She returns to the hospital for a several months stay once every two or three years for check up and further treatment. She has been sterilized with her husband's approval thus eliminating the danger of further pregnancies.

Although in many cases of schizophrenia no direct line hereditary transmissions of the disorder are encountered, sterilization is, in many instances fully indicated not primarily for eugenic reasons. The patient who has recovered from an attack of schizophrenia frequently shows some mental scars which indicate that an additional physical and mental load, especially of such burdensome quality as pregnancy and childbirth would only tend to upset again this patient's equilibrium. In some instances contraceptive advice alone will suffice. Sterilization however in situations where neither spouse is dependable is a more satisfactory solution. To allow the patient to continue to bring children forth when she has neither the physical ability nor the mental balance to care for them would be sheer negligence on the physician's part. On almost every occasion full approval was obtained from the family when the problem of sterilization was presented to them. In instances where the psychosis came on postpartum, the request that the operation be performed frequently came from the husband.

The following cases illustrate such situations:

CASE No 19151 Female—aged 30—married 3 children youngest—6 months—third admission. Diagnosis—dementia praecox, catatonic. F H—One aunt psychotic husband of low grade mentality. Patient's attacks usually followed the birth of each child. She has made an overt attempt at suicide once. She was sterilized following the second admission. Somehow this case was overlooked during the first admission and no suggestions in regard to sterilization were made then. Since the operation was performed she has been adjusting her self satisfactorily outside the institution.

CASE No 19261 Female—aged 37—married 4 children. Diagnosis—dementia praecox catatonic. F H—Paternal grandfather heavily alcoholic father occasionally alcoholic maternal grandmother psychotic two maternal great aunts had nervous breakdowns. The present is the third attack although the first requiring hospitalization and came on several months following the birth of the last child. The patient and her husband approved of the operation and the patient has remained home for over two years making a satisfactory adjustment.

In cases of psychopathic personality where sexual assaults and perversions figure prominently and where institutionalization is needed to prevent the patients from getting into further difficulties sterilization will often help materially in dealing with them while in the institution. Their parole privileges can be increased then, without getting them into more difficulties. The following case histories deal with such problems.

CASE No 16151 Female—aged 30—single. Diagnosis—Psychopathic personality nymphomania, with mild manic depressive episodes. F H—Father alcoholic 1 brother epileptic 1 younger sister suffered from precocious sexuality and also epilepsy and was a patient at this hospital until her death. On a number of occasions she was arrested for sexual misdemeanors. Salpingectomy was performed with the patient's consent. She still however remains a problem because of her runaway habits but the danger of impregnation has been removed by sterilization.

CASE No 17364 Male—aged 21—single. Diagnosis—Psychopathic personality without psychosis. The patient has been exposing himself in public places and has made several sexual assaults on women during his escapes from the hospital. Vasectomy performed on October 11 1930 resulted in no change in the patient's behavior. Following bilateral orchidectomy which was performed May 18 1934 at the patient's request he has reported great diminution in his erotic drive and also some gain in weight. He has not made any assaults on women since the operation but he still remains a problem because of his incorrigibility.

CASE No 17407 Male—aged 24—single. Diagnosis—Psychopathic personality without psychosis. F H—Father alcoholic mother mentally deficient. The patient was a 'blue baby' at birth and there was a questionable history of a head injury during adolescence. At the age of 17 the patient was charged with assault and rape on a young girl. He also tried to attack his mother and sister on several occasions. He stated that the sight of women would arouse uncontrollable sexual desire within him. At his own request a bilateral orchidectomy was performed in November 1933. His sexual drive has disappeared since the operation and for the present he presents only a problem of custodial care. His low mentality prevents his adjustment outside the institution.

With the increase of our knowledge as to the etiology of convulsive seizures the previous assumption that epilepsy was an inherited disorder is rapidly giving way to the modern conception that what is described as epilepsy is really a multitude of pathologic conditions having in common the factor of convulsive seizures. Not every case of convulsive seizure is to be recommended for sterilization even if the patient does require institutional care, in addition, a great many epileptics are able to maintain normal mental and physical health for the rest of their lives in spite of their handicap. But there remains a smaller group where the hereditary factors appear too important to be overlooked. In such instances mental deterioration appears early accompanied perhaps by periods of confusion and excitement. Sterilization would be fully indicated here for a deteriorated epileptic is a poor mother at best, and both the patient and society would benefit from this procedure.

CASE No 19023 Female—aged 23—single. F H—One brother and 2 sisters suffer from epileptic seizures. The patient has had convulsive attacks of moderate severity since the age of 13. They are frequently followed by confused periods. She has an I.Q. of 70 on the 14 year level and of 61 on the



16 year level. She gave birth to an illegitimate child three years ago, of late she has been rather promiscuous sexually. She was discharged from the hospital following sterilization and is able to adjust herself temporarily under luminal therapy.

A number of psychiatric syndromes, having as a common denominator recurrent attacks of overactivity or depression, are at present classified under the heading of manic depressive psychosis. Among them are included atypical anxiety states, panic reactions, situational depressions, catatonic episodes and classical cases of manic depressive psychoses. The incidence of hereditary influence will depend on the diagnostician's conception of the psychosis. In the classical cases the hereditary incidence of the disease is high, reaching 70 to 90 per cent. If the concept is broadened out, the factor of heredity will appear of lesser importance. In institutional cases the diagnosis of manic depressive psychosis is in itself not an indication for sterilization, for it is often found that where the precipitating causes are environmental, improvement in the environment will often eliminate recurrences. Sterilization should only be carried out in selected cases both for eugenic and therapeutic reasons. The first case illustrates the eugenic indication, while the second case was sterilized more for therapeutic reasons.

CASE No 17775 Female—aged 41—married 4 children youngest 2 years old. Diagnosis—Manic depressive depressed. F H—Maternal uncle, maternal grandfather and 2 brothers committed suicide. 1 brother a patient in this hospital with the diagnosis of manic depressive depressed. The patient has had two previous attacks of depression requiring hospitalization in 1921 and 1925 respectively. Following birth of the last child she became irritable depressed and suicidal. The patient was admitted May 31, 1931, was sterilized November 21, 1931, and discharged December 22, 1931. She has been adjusting herself satisfactorily since.

CASE No 18646 Female—aged 34—widow 5 children. First admission in 1923. Second admission in 1933. The patient had the first attack following death of her first husband. She made an uneventful recovery and was discharged as recovered. She remarried, gave birth to 2 more children and, following the death of her second husband broke down again. Her children are at present cared for in an orphanage. She was sterilized January 28, 1934 and discharged August 10, 1934 as recovered. She still remains unmarried, but is well adjusted.

The history of the next patient brings up in retrospect the point as to whether sterilization was fully indicated in her case.

CASE No 17418 Female—aged 25—single. Teacher by occupation. F H—Negative. Patient has had several manic-depressive episodes. She has always suffered from a strong sexual drive during her attacks but has never been promiscuous sexually. Precipitating factors were the death of her mother, her father's remarriage and an unhappy home environment. Operation was performed April 2, 1932. She has married since and has had no recurrences of her mental illness. She is very desirous of hav-

ing children of her own and her husband is financially able to support a family. She would like to have the patency of the tubes reestablished, and the question is brought up in view of her excellent adjustment since leaving the hospital and absence of positive family history, whether the operation was fully justified.

#### DISCUSSION

In order to determine approximately the percentage of patients admitted yearly to the state hospital in whom sexual sterilization was indicated all the case histories of one year's admissions were briefly reviewed. In 4 to 5 per cent of the admissions the operation was found to have been fully indicated either for eugenic or therapeutic reasons. In another 4 to 5 per cent it was felt the operation should have been considered, but there did not appear to be any immediate need for its execution. This group comprised cases where marriage, even after recovery took place, was completely out of the question and where sexual promiscuity did not enter into the picture. Operations in several such cases it was felt, would only have acted as an additional emotional trauma on the patient. In another 10 per cent the operation was only considered, but, because of complete absence of any sexual history or because of the patients' deteriorated mental condition, no definite reasons could be found for subjecting the patients to unnecessary surgery.\*

Before a patient in a mental hospital is subjected to sexual sterilization, unless one is blind beforehand by certain dogmatic statements as to the value of such procedure, one must question what benefits are going to accrue to society or to the patient as a result of this operation. At present the organic psychoses supply about 50 to 60 per cent of our admissions to the state hospitals of this country. In the organic group, heredity plays little rôle in the causation of the mental disorder. If such a patient is sterilized, it must be for therapeutic reasons only. In the remaining 40 per cent, of which dementia praecox supplies about 18 per cent of admissions and manic depressive psychosis about 12 per cent, heredity is often blamed for their occurrence, but how it acts still remains unknown. In our own cases of dementia praecox the children were born before the patient's admission to the hospital, and the sex habits of the majority of dementia praecox patients are such as to preclude any promiscuity or even a moderate degree of fecundity.

According to the Bureau of Census report 94,639 first admissions entered the mental hospitals of the United States in 1932. If the above percentages were applied the operation would be fully indicated for one reason or another in about 4,000 patients. In an equal number the operation would need to be considered. In Germany but with many reservations as to its usefulness, where compulsory sterilization is applied to the population at large for eugenic reasons only, it is expected that about 4 per cent of the population will be sterilized after the law becomes fully enforced although during the first year only about 66,000 sterilizations or about 1 in 1,000 of the general population have been performed at a cost of ten million dollars.

after the onset of the disease. As to the inheritance of dementia praecox, an increased incidence is found in the collaterals, but direct transmissions of the disease are not frequent and in only one instance in our sterilized cases were both mother and daughter affected. In manic depressive psychosis the hereditary incidence is much higher, but again, not every manic depressive is a potential parent of manic depressive offspring, for the disease is not often found in uncles, aunts and cousins rather than in the direct forbears of the patient.

Henderson and Gillespie<sup>4</sup> have well expressed the gist of our present knowledge of the inheritance of mental disease. They state, "Too much stress has been laid on the rôle of heredity in mental disorders, although it must be great. The unvarnished truth is that very little even of what is probable is known of the inheritance of mental instability and almost nothing is firmly established. The reasons for this are various. The primary difficulty which all investigators of human heredity have to encounter is the paucity of satisfactory data and the obstacles to their collection. Human families with their long intervals between generations and the small number of their members, do not lend themselves to study in heredity. Moreover it is often necessary to collect data about ancestors on a hearsay basis only. Such terms as 'nervousness', 'irritability', and so on especially as given by lay persons, can have little value. Yet in spite of the necessary lack of exactitude in mere impressions of this sort, clinical experience forces the conclusion that heredity is of considerable importance. But clinical impressionism is hardly sufficient, and more exact observation is an obvious desideratum." They conclude that "the quantitative difference between the inherited total taint in the psychotic and the mentally normal is surprisingly low. There is, however, a considerably greater direct inheritance of actual mental disorder in the psychotic, while in the normal the indirect inheritance of all types (psychoses organic nervous conditions, and so forth) is greater than in the psychotic. The hereditary tainting, especially with psychoses, is greater in manic-depressive disorders than in any others. Certain families show an abnormally high incidence of mental disease. Mother-daughter transmission is more common than any other. Disorders of manic depressive type especially have a familiar incidence. Clinically dissimilar types do occur in the same family. The inheritance of dementia praecox is more commonly dissimilar. An apparently dissimilar type may possibly be produced by the mingling of ancestral types. Mendelian studies are inconclusive. There is some evidence that manic-depressive insanity follows a dominant and dementia praecox a recessive course. Feeble-

mindedness is said by some to be inherited on Mendelian lines. Alcoholism and nervous disorders are more frequent in ancestors of congenital defectives than in the antecedents of any other types of mental disease."

Much as one would like to rely on the patient's diagnosis alone as a criterion for sterilization, one must confess that psychiatric diagnosis and prognosis are still quite fallible. The diagnosis itself may vary from institution to institution in the same state, as shown by Bancroft<sup>5</sup> in 1914 that the ratio of manic-depressive psychosis to dementia praecox varied from 28.1 to 111.1, respectively, between Taunton State Hospital statistics and those of the Boston State Hospital. In the New Hampshire State Hospital the ratio of manic depressive psychosis to dementia praecox has dropped from 125.1 to 42.1 in the twenty years since Dr Bancroft's survey. If diagnostic criteria can vary to such a degree, one wonders to what extent they are going to affect the psychiatrist's attitude toward sterilization. Would some neurotic anxiety states, mild hypomanic episodes, acute panics or alcoholic excitements be included under the diagnosis of manic-depressive psychosis and therefore be sterilizable or would they be considered as cases not suitable for sterilization, because they really are not cases of manic depressive psychosis? Again in cases of mental deficiency, even where the family history gives no definite indication of the hereditary transmission of the defect, many cases would need to be sterilized if mental deficiency in itself is considered as a sufficient reason for sterilization and provided only the low mental level of the patient is considered. It must not be forgotten, however, that many cases of mental deficiency are not on a hereditary basis. Birth injuries, underweight at birth, head injuries and infections in childhood, all may be causative factors. Sterilization of such an individual may cause the termination of sound germplasm, which in itself is not always affected by the fact that it is transmitted by an individual who through injury to his or her cortex at birth or through infection is below par mentally. This is well illustrated in a recent case in California, where the patient was sterilized at the request of her foster mother because of her low I Q, although no family history of mental deficiency was apparent at the time the sterilization was recommended. Similar situations may occur in association with traumatic epilepsy, in manic-depressive and schizophrenic states coming on following severe infections, in head injuries or in association with brain tumors.

Is compulsory sterilization going to solve the problem of mental disease? It would if all the carriers both latent and active, could be recognized isolated and sterilized, but this of

course would involve sterilizing a large part of the general population outside the hospital. Even in mental deficiency, where the percentage of direct transmission is greater than in any other form of mental disorder, Tredgold<sup>8</sup> states that sterilization of all the feeble-minded in all the institutions would have little or no effect on the increase of mental deficiency in the future, a viewpoint which is concurred in by others. In regard to the number of latent carriers of mental disease, the incidence in the psychotic is not much greater than in the so-called normal. In Dicm's<sup>9</sup> studies, tainting occurred in 77 per cent of psychotic cases and in 67 per cent of the normals. Koller<sup>8</sup> found the ratio of tainting between the normal and the abnormal to be 59:76. In a study of descendants of 1000 schizophrenics carried out by Canavan and Clark<sup>10</sup> at the Boston Psychopathic Hospital, out of 381 children, 295 were considered normal, 4 were feeble-minded, 5 suffered from dementia praecox, 12 were backward and the rest suffered from physical and mental disorders for which the parents' illness may in itself have been a contributing factor. In a later study by the same authors<sup>10</sup> it was disclosed that only 8 out of 370 children, or 2 per cent, became committedly insane. The incidence of schizophrenia in this group is much smaller than in the group studied by Bleuler<sup>11</sup> at Bloomingdale, who found an expectation of illness of schizophrenia among siblings of schizophrenics of 4.8 per cent. The difficulty in accurately detecting active carriers even among mental patients is pointed out by the British Departmental Committee on Sterilization. The members felt "that the legislature would not feel justified in forcing any person to submit to sterilization unless it could be shown beyond reasonable doubt that at least some of the offspring either would be mentally defective or would have a mental disorder, and of this no proof can be produced." They concluded in favor of voluntary sterilization, especially in cases of physical disability that are hereditarily transmitted and in cases of mental disorder where the patient is willing to submit to the operation.

In spite of paucity of accurate knowledge as to the mechanism of transmissions of mental disease and the general lack of agreement as to what is transmitted from parent to offspring, compulsory sterilization can serve as an important therapeutic adjunct in the treatment of patients. Furthermore, it is also useful from the eugenic standpoint. No matter how much one may disregard hereditary factors and blame mental disease on the environment, every institutional psychiatrist has come across individual families that have contributed an exceptionally large number of members as pa-

tients to mental institutions. Such families Mott<sup>12</sup> designates as "bad stock" with the following description: "A bad stock is one where one found a large number of members exhibiting various forms of degeneracy including insanity, e.g., feeble-mindedness, epilepsy, criminality, pauperism, inebriety in fact a general low standard, mental and physical, in stem and branches of the family tree, the further growth of which should be cut off." In wild life it matters little whether a female gives birth to one or one dozen young, those whom she is unable to feed and protect will become eliminated in the course of time. In human society, however, those who are unable to care for themselves are cared for by the state, and, in such instances, the group that is going to bring up and support the future offspring of the defective individual should have some say in regard to their multiplication. Such cases which are really in the minority, attract much attention to the problem of heredity and stimulate much speculation among the uninformed. To a great many, heredity is still an unalterable, magic fluid which is transferred in an unbeknown manner from parent to offspring. It remains forgotten that heredity means much more than the explanation of heredity is not so simple and that typical psychoses are not transmitted from parent to offspring. What is inherited is a mode or reaction to stimuli emanating from without or within, which may express itself grossly only occasionally in a similar psychosis in parent and offspring. This similarity of expression depends on likeness of bodily structure in parent and offspring, an analogy in the layout of their vascular systems, endocrines interrelated similarly in both, and a configuration of nerve cells in both which makes them react much alike to the same stimuli. This physical structure, however, may become modified in the offspring for better or worse through factors introduced by the other parent, through changes in the maternal diet during the individual's intrauterine existence and through prenatal and birth injuries, infections and injuries in infancy and childhood. Heredity thus becomes both a stable and a modifiable entity. Good stock can deteriorate and bad stock can be improved through intermarriage with good stock, although in the human community such experiments cannot be carried out successfully. Attempts at improving bad stock through intermarriage with better stock are usually futile, because it is only on very rare occasions that such Cinderella like marriages take place. A man or a woman coming of poor stock usually marries for lack of better choice, someone coming also from undesirable stock, thus often accentuating and bringing to the fore all the undesirable qualities present in both stocks.

That improvement of the environment and better conditioning early in life is of much value in helping mental deficient to adjust almost on a par with normal individuals has been pointed by Meyer<sup>13</sup> and his associates at the Phipps Clinic in their study of the feeble-minded children in a small suburb in Baltimore Maryland. They found that under supervision and training, even outside an institution, the majority of feeble-minded individuals above a certain level can be adjusted satisfactorily provided someone takes sufficient interest in their problems and takes pains to guide them when guidance is needed. This study also disclosed that the intelligence of the offspring of the mentally deficient individuals was, in many instances much higher than the intelligence of the parents.

Not many accurate studies have so far been carried out to determine the exact influence of environmental changes on the intelligence of the growing child. Freeman and his associates<sup>14</sup> in Chicago have found that early placement of foster children in advantageous surroundings has been of much value in raising the intelligence level of the mentally deficient child. The fact does remain, however, that, in many instances the stock is either so very poor or the environment so hopeless that one feels it best be cut short through sterilization, for, like all living matter, it is better off dead than dying.

The main objection to compulsory sterilization is that it might become a dangerous weapon in the hands of the well meaning but ill informed, reformers, who would proceed to sterilize everybody who had any potentialities for the transmission of mental disease, irrespective of their other good qualities. This has been forcibly pointed out by Myerson<sup>15</sup> in his critique of proposed eugenic sterilization. Again if it were decided to sterilize every inmate in every state institution within child bearing age, our mental hospitals would tend to become training centers for embryo surgeons, a real danger when one considers the low standards existing in some state institutions. The mental hospital would then become a surgical laboratory and sterilization would become a main objective rather than of secondary importance in the prevention of mental disease. Furthermore, it is not always possible to depend on the heads of county institutions to maintain an impartial attitude and not become biased by religious, social and personal reasons. An impartial board, similar to that set up in the Province of Alberta, which would review every case after it was recommended by the county or state authorities, would place compulsory sterilization on more impartial footing and would eliminate any misapplication of the law for any reason whatsoever.

#### SUMMARY

1 The New Hampshire sterilization laws are briefly reviewed and then application discussed.

2 A total of 310 patients have been sterilized during a period extending from April 18 1917 to January 1 1936. Fifty-five patients were sterilized under the old voluntary statute (1917-1929) and 255 patients since the compulsory sterilization law went into effect (1929-1936).

3 So far the law has not been challenged in the courts, and usually no objection is encountered from the patient's family if the purpose of the operation is made clear to them. Frequently the request for the operation has come from an interested member of the family.

4 Data are presented in regard to the diagnostic classification of the cases sterilized, the hereditary findings and the discharges following sterilization. The indications and contraindications for sterilization in selected cases are discussed.

5 A law permitting the performance of therapeutic abortion, whenever indicated, in patients in mental hospitals is suggested.

6 The establishment of a special board of review, similar to that of the Province of Alberta, Canada, which would pass final judgment on cases recommended by the county and state authorities for sterilization and which would act as a further safeguard against over-diligence in application of the law in cases where the indications are doubtful is proposed.

#### CONCLUSIONS

The compulsory sterilization law when applied judiciously to institutional patients, has been found useful for eugenic, therapeutic and prophylactic reasons.

It has permitted an increase in the parole privileges of many patients, has allowed an additional number of visits and discharges, and has also enabled certain patients to get married to whom marriage was previously forbidden because of the New Hampshire statute forbidding the marriage of insane and feeble minded individuals.

The eugenic indications alone should not be considered as the only reason for suggesting the operation. All other factors should also be taken into account.

To Dr Dolloff the superintendent of the New Hampshire State Hospital whose interest in the various aspects of human sterilization made this study possible I wish to express my sincere appreciation for his many valuable suggestions and also for his permission to use the hospital data contained in this report.

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course would involve sterilizing a large part of the general population outside the hospital. Even in mental deficiency, where the percentage of direct transmission is greater than in any other form of mental disorder, Tredgold<sup>6</sup> states that sterilization of all the feeble minded in all the institutions would have little or no effect on the increase of mental deficiency in the future, a viewpoint which is concurred in by others. In regard to the number of latent carriers of mental disease, the incidence in the psychotic is not much greater than in the so-called normal. In Diem's<sup>7</sup> studies, tainting occurred in 77 per cent of psychotic cases and in 67 per cent of the normals. Koller<sup>8</sup> found the ratio of tainting between the normal and the abnormal to be 59.76. In a study of descendants of 1000 schizophrenics carried out by Canavan and Clark<sup>9</sup> at the Boston Psychopathic Hospital, out of 381 children, 295 were considered normal, 4 were feeble minded, 5 suffered from dementia praecox, 12 were backward and the rest suffered from physical and mental disorders for which the parents' illness may in itself have been a contributing factor. In a later study by the same authors,<sup>10</sup> it was disclosed that only 8 out of 370 children, or 2 per cent, became committedly insane. The incidence of schizophrenia in this group is much smaller than in the group studied by Bleuler<sup>11</sup> at Bloomingdale, who found an expectation of illness of schizophrenia among siblings of schizophrenics of 4.8 per cent. The difficulty in accurately detecting active carriers even among mental patients is pointed out by the British Departmental Committee on Sterilization. The members felt "that the legislature would not feel justified in forcing any person to submit to sterilization unless it could be shown beyond reasonable doubt that at least some of the offspring either would be mentally defective or would have a mental disorder, and of this no proof can be produced." They concluded in favor of voluntary sterilization, especially in cases of physical disability that are hereditarily transmitted and in cases of mental disorder where the patient is willing to submit to the operation.

In spite of paucity of accurate knowledge as to the mechanism of transmissions of mental disease and the general lack of agreement as to what is transmitted from parent to offspring, compulsory sterilization can serve as an important therapeutic adjunct in the treatment of patients. Furthermore, it is also useful from the eugenic standpoint. No matter how much one may disregard hereditary factors and blame mental disease on the environment, every institutional psychiatrist has come across individual families that have contributed an exceptionally large number of members as pa-

tients to mental institutions. Such families Mott<sup>12</sup> designates as "bad stock" with the following description: "A bad stock is one where one found a large number of members exhibiting various forms of degeneracy including insanity, e.g., feeble mindedness, epilepsy, criminality, pauperism, inebriety—in fact a general low standard, mental and physical, in stem and branches of the family tree, the further growth of which should be cut off." In wild life it matters little whether a female gives birth to one or one dozen young, those whom she is unable to feed and protect will become eliminated in the course of time. In human society, however, those who are unable to care for themselves are cared for by the state, and, in such instances, the group that is going to bring up and support the future offspring of the defective individual should have some say in regard to their multiplication. Such cases which are really in the minority, attract much attention to the problem of heredity and stimulate much speculation among the uninformed. To a great many, heredity is still an unalterable, magic fluid which is transferred in an unknown manner from parent to offspring. It remains forgotten that heredity means much more, that the explanation of heredity is not so simple and that typical psychoses are not transmitted from parent to offspring. What is inherited is a mode or reaction to stimuli emanating from without or within, which may express itself grossly only occasionally in a similar psychosis in parent and offspring. This similarity of expression depends on likeness of bodily structure in parent and offspring, an analogy in the layout of their vascular systems, endocrines interrelated similarly in both, and a configuration of nerve cells in both which makes them react much alike to the same stimuli. This physical structure, however, may be come modified in the offspring for better or worse through factors introduced by the other parent, through changes in the maternal diet during the individual's intrauterine existence and through prenatal and birth injuries, infections and injuries in infancy and childhood. Heredity thus becomes both a stable and a modifiable entity. Good stock can deteriorate and bad stock can be improved through intermarriage with good stock, although in the human community such experiments cannot be carried out successfully. Attempts at improving bad stock through intermarriage with better stock are usually futile, because it is only on very rare occasions that such Cinderella-like marriages take place. A man or a woman coming of poor stock usually marries for lack of better choice, someone coming also from undesirable stock, thus often accentuating and bringing to the fore all the undesirable qualities present in both stocks.

In ten out of several hundred cases done with this method the author noted the appearance of Horner's syndrome which, however, cleared up after about an hour, the patient not being aware of it at any time. This complication harmless as it has proved to be, can be avoided by not pushing the injection needle beyond the plane of the posterior pillar.

Alföldy<sup>32</sup> believes that in such skin diseases as acute and chronic dyshidrosis and eczema severe nasal and pharyngeal pathology (tonsillitis sinusitis and so forth) are often found. Indications for tonsillectomy and sinus surgery should be based on the objective findings regardless of subjective histories.

As an aid to diagnosis of allergy Kallos<sup>33</sup> examined smears taken from the nose, sinuses, and tonsils of 120 patients for eosinophiles. Where possible, the results were checked by means of histologic examination of tissues. A count of 6 per cent was regarded as normal. In chronic rhinitis and sinusitis the secretions contained 10-50 per cent eosinophiles. The same percentages were found in the nasal secretions of cases with polyposis. In acute suppurative sinusitis the secretions contained less than 6 per cent. The tonsil secretions of patients with articular and muscular rheumatism likewise showed a marked increase and even preponderance of eosinophiles. Tonsil secretions of patients without arthritic or allergic disease showed no such increase. Frequently only one tonsil was positive.

#### NASAL SINUSES

It is now realized by most internists and otolaryngologists that there is a close interrelationship between various types of sinus infection and certain diseases of the lower respiratory tract, but is it highly necessary that the general practitioner should have a clear understanding of the importance of a prompt and thorough investigation of the sinuses in an effort to explain the cause of most of the chronic nontuberculous chest diseases? Much valuable time could be saved to the patient if a competent otolaryngologist were consulted early in such cases. The chest conditions that can be traced most directly to sinus disease are peribronchitis, tracheobronchitis, bronchitis, bronchiectasis and many cases of bronchial asthma. McLaurin<sup>34</sup> discusses these in detail and concludes that the indications for sinus surgery in asthmatics are as follows:

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nitis with exacerbations of the sinus disease seem to precipitate attacks of asthma.

- 4 Cases in which the patient has been proved sensitive to his own infection but the local sinus pathology would not ordinarily require surgery.

Hodge<sup>35</sup> agrees that the association of nontuberculous bronchiectasis and infection of the paranasal sinuses is extremely common. Pulmonary collapse and pneumonitis, frequently noted in early childhood, so weaken the structure of the lungs that there is a suitable soil for subsequent infection. Bronchiectasis as evidenced by the number of dry cavities reported in the lungs of both children and adults, is more frequent than was previously supposed. Infection of the sinuses associated with bronchiectasis may date from early childhood or may occur as a secondary infection in later life. The treatment of bronchiectasis is surgical. Any focus of infection should be, when possible, removed from the upper respiratory tract before surgical intervention on the lungs is attempted. Best results will be obtained from medical treatment if it is commenced in early childhood.

Fenton and Larsell<sup>36</sup> have continued their experimental study of artificially produced sinusitis. They are convinced that any preparation applied to the surface of the nasal membrane is an irritant unless its strength is isotonic.

Linton<sup>37</sup> has also performed experimental studies by the injection of a vaccine virus-bacteria-testicular extract combination into the maxillary sinus of the rabbit.

Lierle and Moore<sup>38</sup> in their experimental work have made use of a transparent window in the lateral walls of the maxillary sinus of living rabbits. The investigators find that although drugs depressed or stopped the activity of the cilia only those which were actual cautery agents produced any permanent injury.

Boling<sup>39</sup> repeats the experiments of McGregor and Knowlton by studying the regeneration of the maxillary sinus mucosa of the lamb. He found complete regeneration, including the glands within two months' time.

Articles on sinus surgery have been written by Mithoefer<sup>40</sup> Sewall<sup>41</sup> Luongo<sup>42</sup> Chase<sup>43</sup> McNaught<sup>44</sup> Good<sup>45</sup> and others.

Skallern<sup>46</sup> calls our attention to obliterative frontal sinusitis. This disease is an osteogenic thickening resulting from a pathologic stimulus and is classified as a benign bony tumor. Osteogenesis is nature's protective mechanism to infection and depends on the ability of the compact bone to respond to a bacterial or traumatic stimulus. The usual finding is that of unilateral osteogenic thickening affecting chiefly the anterior plate of the frontal sinus. The roentgenogram diagnosis may be



himself and Prof. R. T. Hewlett, forty years ago, on the micro organisms in the healthy nose. They showed that in 80 per cent of their cases, the nasal mucus was sterile. This work has stood the test of time. Thomson then enumerates in detail the various modes of defense, in normal conditions of health, of the air passages against bacterial invaders. The mucus and the cilia form the first and most important line of defense and are mutually interdependent for the efficiency of their functioning. He gives a detailed account of the action of the cilia in the various parts of the nasal cavities and of the methods employed in their study, as well as their relationship to clinical and pathologic manifestations. The chief purpose of the author is to show the complexity and perfection of these local defenses, to appreciate their arrangement, their modes of action, and their compensatory interactions, and to encourage interest in normal processes as a necessary first step to the study of disease. Viktorow<sup>21</sup> observed ciliary activity by placing tiny charcoal particles on isolated frog esophagi.

Ciliary motion was inhibited by alkaline salts, such as sodium bicarbonate and sodium borate, also by menthol and glycerine. Cocaine 2-3 per cent narcotized the epithelium after a preliminary acceleration and cocaine 1 per cent narcotized without previous acceleration and phenol 0.2 per cent, accelerated ciliary motion.

Rennell<sup>22</sup> studied the behavior of ciliated epithelium of adenoid tissue at various temperatures and after subjecting the specimens to various chemicals, notably to drugs usually employed in the treatment of the nose. Some of the drugs were dissolved in distilled water and Ringer's solution respectively. Most drugs caused retardation and arrest of ciliary motion with the single exception of ephedrine which had a decided acceleratory effect. Final lavage of the specimens with Ringer's solution had various results. In some cases motion was re-established to varying degrees, in others the arrest was permanent. Thus there was permanent loss of motion after distilled water, cocaine 20 per cent, percarine 3 per cent, pantocaine 2 per cent (both in distilled water and in Ringer's), Lugol's solution 1 per cent, silver nitrate solution 0.01-2 per cent, and ammonia 0.5-3 per cent. Partial recovery occurred after the use of adrenaline 1 per cent, glycerine, phenol 0.1-1 per cent, ammonia 0.1-0.2 per cent, and chlorine inhalant. The recovery was perfect after alcohol 5-20 per cent. Alcohol 5 per cent in Ringer's solution merely slowed the action. Fetisow<sup>23</sup> refers to the experimental work done on animals and cautions against the indiscriminate acceptance of the conclusions in regard to man. In his opinion man is far more adaptable in this respect than dogs and rabbits. As a proof of his contention he cites three luetic cases of

complete nasal obstruction of three, five and six years' duration respectively. Biopsy specimens were taken from the inferior turbinates. All showed a completely normal mucous membrane.

Tchudnosovetof<sup>24</sup> made further experiments in order to determine the true nature and significance of the type of breathing (i.e., nasal or tracheal) on the subarachnoid injection of India ink. Thirty-seven dogs were used. In ten of these nasal breathing was used, in twelve tracheotomy was done, and the nose and mouth excluded as respiratory pathways, in the remaining fifteen mixed breathing was used.

After the death of the animals the macroscopic and microscopic appearance of the nasal mucosa and the condition of the cervical lymph nodes were observed. It was found that in tracheal breathing a stagnation of the tissue fluids developed in the nasal cavity, which endangers the well-being of the organism by giving rise to conditions favorable for the penetration of all kinds of infectious agents.

#### TONSILS

Zoltán<sup>25</sup> investigated the relationship between chronic tonsillitis and thyroid disorders. Laboratory tests done before and after tonsillectomy showed no relationship of a hormonal nature. One could rather think of an infectious metastatic relation. A few carefully observed cases of goitre cured by tonsillectomy support this assumption.

Key-Aberg<sup>26</sup> described "deep" peritonsillar abscess and contrasts it with the usual "high" variety. The symptomatology of the "deep" abscess differs from that of the "high" as follows. Trismus is moderate or insignificant, redness and swelling of the faucial region are much less, absence of tenderness and fluctuation, marked adenopathy at the angle of the lower jaw, especially in children and young people, often resulting in a torticollis attitude. In addition to these symptoms the patient complains of pain, sore throat, and at times dyspnea. If there is a suspicion of a deep abscess an exploratory puncture is made. If this is negative, the case is considered one of "deep" abscess. His treatment is enucleation of the diseased tonsil. The author has treated 170 cases of peritonsillar abscess, twelve of which were of the "deep" variety.

Rubin<sup>27</sup> reports a case of an unusually large calculus of the tonsil, the tonsil with the stone weighing 24 2/3 grams.

Meurman<sup>28</sup> recommends his simplified modification of Gowen's nerve block anesthesia for tonsillectomy. Inasmuch as the injection needle does not come in contact with the tonsil itself, this procedure is especially indicated in doing tonsillectomy during the course of acute throat conditions such as septic sore throat and peritonsillar abscess.



In ten out of several hundred cases done with this method the author noted the appearance of Horner's syndrome which, however, cleared up after about an hour, the patient not being aware of it at any time. This complication, harmless as it has proved to be, can be avoided by not pushing the injection needle beyond the plane of the posterior pillar.

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Articles on sinus surgery have been written by Mithoefer,<sup>40</sup> Sewall,<sup>41</sup> Luongo,<sup>42</sup> Chase,<sup>43</sup> McNaught,<sup>44</sup> Good<sup>45</sup> and others.

Skilern<sup>46</sup> calls our attention to obliterative frontal sinusitis. This disease is an osteogenic thickening resulting from a pathologic stimulus and is classified as a benign bony tumor. Osteogenesis is nature's protective mechanism to infection and depends on the ability of the compact bone to respond to a bacterial or traumatic stimulus. The usual finding is that of unilateral osteogenic thickening affecting chiefly the anterior plate of the frontal sinus. The roentgenogram diagnosis may be

"failure of development" or "absence of" the affected sinus. Even if negative, no x-ray diagnosis of sinus disease should be accepted unless confirmed by the rhinologist. And when the roentgenogram shows a large unilateral frontal cell ending abruptly at the midline of the forehead, its fellow should be suspected of osteogenesis. Failure to make this diagnosis results in multiple intranasal operations which do not give relief of symptoms.

Kramer<sup>47</sup> reports a case of primary actinomycosis of the sphenoid proved by autopsy.

Gundrum and Semenov<sup>48</sup> report 64 per cent improvement in a series of 135 cases of sinusitis treated by the displacement method as advocated by Proetz.

Warren<sup>49</sup> believes that deep x-ray therapy is a valuable adjunct in the treatment of chronic sinusitis.

Osteoma of the nasal accessory sinusitis has been the subject of papers by Hoover and Horrax,<sup>50</sup> Bryant,<sup>51</sup> Carmody,<sup>52</sup> Gatewood and Settel.<sup>53</sup> Hoover and Horrax advocate transcranial approach to the orbit.

The blood vessels of the lateral nasal wall and their relation to the turbinates and sinuses have been studied by Burnham.<sup>54</sup> This investigation has brought to light a number of anatomic points of interest which have not previously been recorded, and many of them have an important clinical bearing.

Comparatively large canals are present in the central part of the middle and posterior half of the inferior turbinate bones. They contain, (1) terminal branches of the turbinate arteries, (2) veins ("jacket plexus"), which form an essential part of the "venous pathways", (3) nerves.

Three definite canals are present in the posterior half of the inferior turbinate. The uppermost of these canals contains vessels for the antrum and its connection with the latter through the "uncinate aperture" is described. The "aperture" is a very important and constant naso-antral bony opening, inferior to the uncinate process, through which the antrum obtains a large part of its blood supply.

The term "venous pathways" has been used to indicate the large channels of veins which carry the blood over the lateral nasal wall to the sphenopalatine foramen. They are three in number: (1) inferior turbinate, (2) middle turbinate, and (3) superior turbinate venous pathways. Each pathway is made up of erectile vessels which pass into either periosteal or "intraosseous" veins and each of these joins the "jacket plexus" of veins within the bony canals of the turbinate. They then leave the canals, passing into periosteal veins again before reaching the sphenopalatine foramen.

The "intraosseous" veins are mainly present in minute bone canals in the anterior half

of middle and inferior turbinates and have not previously received consideration in the literature.

The superficial veins of the lateral nasal wall present such sharp turns and twists in their courses that they may be described as convoluted.

This subject has also been investigated by Swindle,<sup>55</sup> who believes that the arterial network in the mucous lining of a nasal passage of a postnatal mammal consists of two interconnected and intricately interlaced networks. One of these consists of numerous, thin-walled, very inflatable, vein-like arteries which do not give rise to arterio-capillary anastomoses. The other network consists of numerous slender vessels which are more like typical arteries of the same size elsewhere in the body. The typical arteries give rise to numerous arterio-capillary anastomoses. Some of the connections between the two networks resemble true arteriovenous anastomoses (AVAS) and were accordingly called pseudo arteriovenous anastomoses.

#### BRUCELLOSIS

Cases of brucellosis are now reported from every state in the Union, Canada, the British Isles, Scandinavia, Germany, France and Austria. Etiologically it follows the drinking of milk contaminated by *Brucella* or contact with infected cattle or domestic animals. Its incidence in infancy, childhood and adult life is apparently increasing owing to the extensive and thorough search for the organism.

Cody<sup>56</sup> reports four cases and describes the method of diagnosis. He states that the otolaryngologist comes in contact with the complications of brucellosis as well as with the systemic infection. Nerve deafness may occur, as in other infections. The complication of mucosal lesions of the pharynx and larynx may resemble those of tuberculosis and syphilis. The systemic infection occasionally simulates some aspect of pyogenic infection of the ear, nose and throat. Only rarely will the need even of considering brucellosis arise except in patients with fever of uncertain origin and in typical cases.

#### LEUKEMIA

Love<sup>57</sup> has reviewed 152 cases of leukemia. He has personally observed forty-one cases. The purpose of his paper is to indicate the frequency of leukemia manifestations in otolaryngologic practice, to describe the pathologic changes and the differential diagnosis and to report illustrative cases of each type. Love's conclusions are that in the vast majority of cases of acute or chronic leukemia there is clinical evidence of the disease in the ear, nose, mouth and throat. Symptoms of hemorrhage in the middle or internal ear, epistaxes, necrotic lesions in the mouth, throat or larynx, petechial or massive hemorrhages from the mucous mem-

brane of the mouth the pharynx or the nose or from the gums after the extraction of teeth or any other operation in the mouth nose or throat extreme anemia of the same structures and necrotic lesions of the larynx or cervical adenopathy without obvious cause all point to the possibility that the patient may be suffering from a blood dyscrasia especially a form of leukemia. These findings together with the other general symptoms of this type of disease indicate the need of an accurate hematologic study.

Pioetz<sup>6</sup> writes a very good article on the syndrome of pain and paralysis arising from inflammation of the prevertebral space. He describes the various symptoms as

- 1 Deep pain as of a muscle spasm, an inch to one side of the spinous processes anywhere between the seventh cervical and the third thoracic vertebrae. This is the most constant symptom.

- 2 Futile attempts to hold the head in some position which will relieve the deep cervicothoracic tension, partial relief of lying supine.

- 3 Radiation of the pain to the arm, involving any or all of the branches of the brachial plexus.

- 4 Weakness and paralysis of various muscles attributable to brachial neuritis.

- 5 Occipital pain and tenderness.

- 6 A sore spot in such proximity to the esophagus that a bolus of food passing down the tube increases the pain.

- 7 Inflammation of the pharyngeal lymph tissues or history of recent acute infection of these tissues.

- 8 Absence of fever or other severe systemic effects.

In view of their anatomic position and their nerve supply, complications of eruption of the wisdom teeth both upper and lower, include many conditions which are properly classified as otorhinolaryngologic. Henry<sup>39</sup> has collected over seven hundred cases of complications, half of them taken from the published literature and the other half supplied to him by colleagues all over the world from their private notes. Since they include a number of cases in which a wrong diagnosis has been made and the patient has been subjected to ineffective other treatment, often for quite long periods of time it seems that a report of some of these cases should be of value to the specialist in the ear nose and throat. The cases are analyzed under four main headings, viz, the ear the sinuses the throat and operative accidents relating to this field.

Costen<sup>40</sup> has studied the pathologic conditions of the mandibular joint due to various kinds of malocclusions. The chief complaint of each case was a "burning tongue."

In each case during the examination, the pain was partially or completely relieved when the condyle was moved away and downward from the joint by interposing test disks between the jaws. The thickness of the disk pack was judged grossly by the looseness of the lower jaw.

The success with which permanent relief was obtained depended on dentures which increased the vertical dimension of the jaw and moved the condyle away from the range of the chorda tympani and auriculotemporal nerves.

Irritation of these nerves, especially the auriculotemporal, sufficient to produce reflex pains in the remaining branches of the mandibular nerve is proposed as the principal etiologic factor in the production of "burning tongue" or "neurosis of the mouth" without gross lesions.

A brief review of the literature on the syndrome of anemia glossitis and dysphagia is given by Hoover<sup>41</sup>. The anemia is recognized as that reported as "Idiopathic hypochromic anemia." The glossitis may more properly be described as an atrophic tongue and does not differ from that described in connection with other diseases. The dysphagia is often due to mechanical obstruction of the upper portion of the esophagus. The treatment consists of mechanical dilatations of the esophagus and the prescription of iron salts in adequate dosage with or without liver.

#### MALIGNANCY

Under the title of adenocarcinoma Watson<sup>42</sup> describes a group of forty-one loosely related tumors of the mouth most of which seem, however, to be derivatives of the salivary gland tissues, resembling the well-known "mixed" types which occur in the parotid and submaxillary region.

These neoplasms occur anywhere in the oral cavity, but usually beneath the mucous membrane of the hard and soft palates in the mucosa of the cheek, especially at the mouth of Stensen's duct.

Treatment varies with the individual case, but the routine at the Memorial Hospital includes preliminary external irradiation by divided doses of roentgen rays (though the author states that the growths are radioresistant) the implantation of gold radon seeds and a final wide excision with the actual cautery. The five year results are fairly good 36 1/2 per cent of the patients who have been treated are alive and well.

The methods used at the Memorial Hospital in New York for the treatment of cancer of the lip have been gradually developed during the last twenty years as the result of accumulated experience in the treatment of over 1000 cases. In early cancer of the lip according to Martin<sup>43</sup> surgery radiation and cautery give an equally good chance of permanent cure if prop-

erly employed, provided metastases to the neck have not occurred. The preference for radiation for these small primary lesions is based entirely upon the superiority of the cosmetic result. Large, advanced lesions for the most part offer little chance of a good cosmetic result by any method, and, in these, surgery is the method of choice from the standpoint of the shortest morbidity and a reasonably satisfactory functional result. Histologic confirmation of the clinical diagnosis is essential in cancer of the lip where curative treatment is intended, whether by surgery or radiation.

The author does not agree with the principle of giving prophylactic treatment to the neck either by surgery or radiation in the absence of palpably involved nodes.

In the group of patients with enlarged, palpable nodes in the neck, probably metastatic and operable, either radiation or surgery has been used. Only those cases in which the primary lesion was definitely to one side of the mid-line, and in which the primary lesion was either under control or clearly capable of being controlled, were considered as suitable for neck dissection.

During the last few years, with the better development of the technique of gold radon implantation and divided or protracted doses of external irradiation, the treatment of neck metastases by a combination of radiation and limited surgery has been more generally used.

Shambaugh<sup>64</sup> finds that fishermen in the Massachusetts region are exposed, in the handling of tarred nets, to the most strongly carcinogenic type of tar, namely horizontal retort gas works tar. The lips are especially apt to be contaminated with the tar owing to the frequent practice of holding the tar-smeared needle in the mouth while repairing the nets, in eight cases of cancer of the lip in fishermen reported, it is believed that such an exposure to tar was an important causative factor.

These observations suggest that exposure to tar may be partially responsible for the apparent high incidence of cancer of the lip in fishermen.

Martin and Pflueger<sup>65</sup> find that cancer of the cheek is chiefly a disease of old age and is seen less often in young people than any other form of intraoral cancer. Chronic irritation is the most obvious etiologic factor. Definite evidence of dental irritation, either from sharp teeth or from ill fitting dentures, was found in 23 per cent of the cases. Metastases tend to occur at a comparatively late stage of the disease.

In treatment, three problems must be considered: (1) the hygienic care of the oral cavity, (2) the primary lesion should be treated almost entirely by irradiation, and (3) the problem of the treatment of metastases should

be considered separately. If no nodes are palpable at the time of admission, one treatment by external irradiation to the cervical region is given, following which no further treatment is administered to the neck until definite palpable evidence of the presence of metastasis appears. The authors are definitely opposed to prophylactic neck dissection. If metastases are present at the time of admission, it is the usual practice either to perform a radical neck dissection after treatment of the primary tumor or to insert gold seeds after the surgical exposure of the nodes by a short incision through the skin and subcutaneous tissues only. With the exclusion of the cases of advanced disease in which palliative treatment only was given, the primary tumor was controlled in forty-nine of the sixty-seven cases in which attempts at a cure were made. Five-year cures were obtained in twenty-eight patients or 30 per cent of the entire group.

If epithelioma of the lower lip can be determined clinically, a wide V-shaped excision followed by removal of the lymph nodes of the neck is recommended by New<sup>66</sup>. For more extensive lesions, a wide excision and a plastic operation at either angle of the mouth and upper lip are usually necessary to reconstruct the lower lip. In a series of 547 patients with epitheliomas of the lower lip, 357 survived five or more years after treatment. Five-year cures were obtained in 89.7 per cent of 234 patients with dissected but uninvolved cervical nodes, in 65.8 per cent of 196 patients in whom the nodes were not involved clinically and were not dissected, and in 39.1 per cent of forty-six patients in whom the nodes were involved and dissected.

In carcinoma of the tongue a wide removal of the growth with diathermy or the cutting cautery is advisable, where possible, as well as a bilateral dissection of the submental and upper cervical lymph nodes on the involved side if there is no extension to the lymph nodes. If the lymph nodes are involved, a block dissection on that side should be done. The highly malignant lesions which occur more frequently at the base of the tongue may be treated by the insertion of radium directly into the tumor by external irradiation. The removal of the cervical lymph nodes, however, is an essential part of the treatment of carcinoma of the tongue.

Of a series of 162 patients 37.2 per cent of the 156 traced patients were living five or more years after operation. Five-year cures were obtained in 50 per cent of fifty-eight patients in whom the nodes were not involved but were dissected, in 52.8 per cent of thirty-six patients in whom the nodes were not involved clinically and not dissected, in 14.3 per cent of fifty-six patients in whom the nodes were involved and

dissected, and in 33.3 per cent of six patients in whom the growth had extended to the floor of the mouth.

In the lesions which have spread to the cheek the removal of the submental and submaxillary lymph nodes adds considerably to the chance of preventing extension to the neck. Five-year cures were obtained in ninety of 187 patients operated on for epithelioma of the lower jaw, which represented a relative curability of 59.6 per cent of the 151 patients traced. Twenty-eight and nine-tenths per cent of thirty-eight patients with node involvement and 69.9 per cent of 113 patients without node involvement lived five years or more after operation.

During the last fifteen years there has been a marked change in the treatment of malignant tumors of the upper jaw and antrum. It has been found that the use of cautery and irradiation eliminates the operative mortality and more patients are well without recurrence after this method of treatment than after the older methods of resection of the upper jaw. Two hundred and thirty-six of two hundred and ninety-five patients so treated, have been traced, 53.8 per cent have lived five or more years after treatment.

Kaplan<sup>67</sup>, Simpson,<sup>68</sup> and Livingston and Lieber<sup>69</sup> also write on the treatment of carcinoma of the tongue.

Quick<sup>70</sup> believes that complete unilateral neck dissection occupies a definite, yet very limited field in the treatment of intraoral, pharyngeal and laryngeal cancer. It should be reserved for those cases of fully differentiated epidermoid carcinoma in patients of good general physical condition, in whom the primary growths have been controlled or give substantial promise of control and in which the metastatic nodes are unilateral, palpable, and present clinical evidence of an intact capsule. Care should be taken to differentiate the inflammatory nodes and inflammatory areas in the submaxillary salivary gland stimulating a node, and true metastatic nodes. With the exception of patients with lip cancers in whom dissections limited to both submental groups and the submaxillary and upper deep cervical groups of the involved side are recommended, neck dissection should be the most radical possible. If no cervical lymph nodes are palpable, external irradiation is all that is indicated except for a follow-up at frequent intervals.

When these narrow limits on neck dissection are considered it becomes apparent how diverse are the conditions in which implantation of radium must be employed. External irradiation can be depended upon only in the strictly anaplastic growths. Implantation of radium should not be resorted to for short-term palliation, which is a problem for external irradiation, but should be planned with the idea of a substantial

or complete control of the primary growth. Maximum external therapy should always precede implantation.

It is believed that the narrowing of the limits for neck dissection and the gradually increasing scope of interstitial irradiation of metastatic tumor in the cervical nodes have conferred a larger benefit on a greater number of patients than did the former plan of free resort to dissection without adequate selection of cases.

Fischel<sup>71</sup> describes in detail the technique of unilateral block resection of the lymph nodes of the neck for carcinoma, including the removal of the sternomastoid muscle, internal jugular vein, and omohyoid muscle. In a series of seventy-four private cases operated on between the years 1918 and 1935 by this technique there were seven operative deaths, a mortality of 9.5 per cent.

Nineteen cases of malignant tumor of the nasopharynx encountered at the Massachusetts Eye and Ear Infirmary are reported by Heine.<sup>72</sup>

From the study of these cases these conclusions were drawn:

1. The nasopharynx bears a rather fertile soil for the development of the various types of neoplasm.

2. Any abnormality in the appearance of the tissue in this region is worthy of biopsy.

3. Tumors arising from the different kinds of epithelium covering over the vault of the nasopharynx are different both pathologically and clinically from most other epithelial tumors and evidently deserve some special classification.

The results in this series are in support of radiation therapy, but the follow-up was limited to a period too short for conclusions as to the permanency of results.

In a series of twenty-four malignant tumors of the epipharynx studied by Salinger and Pearlman<sup>73</sup> transitional cell carcinoma was, in the opinion of three pathologists, the most common type.

The early and characteristic symptoms of transitional cell carcinoma were found to be painless cervical adenopathy, tinnitus or deafness and pains due to involvement of the first and second branches of the trifacial nerve.

In the majority of cases the tumor originated in the region of the eustachian tube or the lateral wall of the nasopharynx, thus accounting for the symptoms enumerated.

Lyne<sup>74</sup> discusses the pathologic changes that occur in tissues which have been exposed to radium in sufficient doses to cause a burn. The author classifies radium burns into three groups or stages:

1. The stage of engorgement. This is early and is the stage of slight erythematous swelling and subsequent complete recovery of the tissues.

2. The stage of constriction. This leads to

injury to the tissues, although no scar results, the tissues are definitely injured

3 The stage of necrosis Following the slough there is scar formation with atrophy of the tissues and permanent damage to the underlying structures with a possibility of trouble at a later date

Heine<sup>55</sup> records observations made upon the behavior of ciliated epithelium after (1) the exposure of hanging drop specimens of ciliated epithelium to the action of radon seeds, (2) the exposure of sections of rabbit's trachea to the direct action of roentgen ray, and (3) the implantation of a fixed dosage of radium in the nostrils of rabbits

His conclusions are that goblet cells may be another form of ciliated epithelial cells and are probably degenerative. The metabolic rate of epithelial cells evidently is not affected by roentgen ray when the metabolic rate is measured by changes in the Ph, of the solutions containing the tissues. It seemed that some dosages of roentgen ray are actually stimulating. Ciliated epithelium is not a delicate structure in that it stands with impunity a 24 erythema single dose. A single dose of unfiltered roentgen ray of eight erythemas is the maximum for the skin of man

Many very good articles have been written on the treatment of cancer of the larynx. The consensus indicates that when the growth is limited to one vocal cord it is operable by laryngofissure and curable in eighty per cent of cases. When the growth is extensive, laryngectomy still appears the best chance of cure. Without a question the Coutard method of x-ray therapy is a valuable adjunct in the treatment of the nonsurgical cases. With more experience it may replace surgery, but in the light of our present knowledge we feel that the operable case stands best chance of cure by surgery.

Garfin<sup>56</sup> reviews 202 cases, Harrison and Sarasin,<sup>57</sup> Lenárt,<sup>58</sup> Maitin,<sup>59</sup> Harris,<sup>50</sup> Cutler<sup>61</sup> and Lenz<sup>62</sup> write on the x ray treatment. Thomson<sup>63</sup> writes on laryngofissure. Chevalier Jackson and C. L. Jackson<sup>64</sup> state that malignant disease of the larynx is encountered in nine different forms: (1) Squamous cell epithelioma, which is the commonest form and constitutes about 98 per cent of the cases, (2) basal-cell carcinoma, (3) glandular-cell carcinoma, (4) endothelioma, (5) sarcoma, (6) malignant osteomyoma, (7) osteosarcoma, (8) a peculiar type of chondroma which destroys the entire larynx, and (9) precancerous conditions, potentially malignant, which are chiefly keratoses and leukoplakias.

Laryngofissure has advanced to the point where eighty-two per cent of cures can be obtained provided the operation is limited strictly

to the type of case to which it is adapted. It affords operative access to the interior of the larynx by splitting the thyroid cartilage. It is indicated in intrinsic cancer of limited extent whatever the type or degree of malignancy. In cases in which the anterior wall of the arytenoid is involved, even though the growth has not yet become extrinsic, laryngofissure had better not be done if the malignancy is graded as III or IV. If, however, the tumor is of Grade I or II, laryngofissure is indicated. In such cases it is necessary to remove all of the corresponding arytenoid cartilage. If the growth has become even partially extrinsic by extension, it is beyond the limits of adequate removal by laryngofissure.

Laryngectomy is indicated in, (a) cases of intrinsic cancer of the larynx that have extended so far posteriorly that there is a probability that laryngofissure will be inadequate and (b) extrinsic malignant disease of limited extent as of Grade I or II. In every extensive growth of Grade I or II and in Grade III or IV growths irradiation is preferable to operation of any kind. In patients with cardiovascular disease, tuberculosis, nephritis, and diabetes, it is, in many cases, advisable to trust to radiation rather than to risk a major operation such as laryngectomy. Laryngofissure, on the other hand, is a relatively minor procedure and has few, if any, contraindications.

Recurrences take place in about eighteen per cent of cases after laryngofissure and in about forty per cent of cases after laryngectomy for carcinoma of the larynx. As a general rule irradiation by the Coutard technique is superior to further operation for these recurrences.

Buckley<sup>65</sup> says that the operation called laryngectomy is no longer in its infancy, but is rather a well established and recognized procedure, with many hundreds of cancer cures standing to its credit.

To obtain the best results a preliminary biopsy is essential, not alone definitely to establish a diagnosis but also to insure that very important microscopic study which is so necessary in deciding what therapeutic procedure shall be instituted.

A series of laryngectomies seems to indicate that surgery still definitely stands out as the most powerful foe opposing cancer of the larynx.

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injury to the tissues, although no scar results, the tissues are definitely injured

3 The stage of necrosis Following the slough there is scar formation with atrophy of the tissues and permanent damage to the underlying structures with a possibility of trouble at a later date

Heine<sup>75</sup> records observations made upon the behavior of ciliated epithelium after (1) the exposure of hanging drop specimens of ciliated epithelium to the action of radon seeds, (2) the exposure of sections of rabbit's trachea to the direct action of roentgen ray, and (3) the implantation of a fixed dosage of radium in the nostrils of rabbits

His conclusions are that goblet cells may be another form of ciliated epithelial cells and are probably degenerative The metabolic rate of epithelial cells evidently is not affected by roentgen ray when the metabolic rate is measured by changes in the  $\text{P}_{\text{H}}$  of the solutions containing the tissues It seemed that some dosages of roentgen ray are actually stimulating Ciliated epithelium is not a delicate structure in that it stands with impunity a 24 erythema single dose A single dose of unfiltered roentgen ray of eight erythemas is the maximum for the skin of man

Many very good articles have been written on the treatment of cancer of the larynx The consensus indicates that when the growth is limited to one vocal cord it is operable by laryngofissure and curable in eighty per cent of cases When the growth is extensive, laryngectomy still appears the best chance of cure Without a question the Coutard method of x-ray therapy is a valuable adjunct in the treatment of the nonsurgical cases With more experience it may replace surgery, but in the light of our present knowledge we feel that the operable case stands best chance of cure by surgery

Garfin<sup>76</sup> reviews 202 cases, Harrison and Sarasin,<sup>77</sup> Lenart,<sup>78</sup> Martin,<sup>79</sup> Harris,<sup>80</sup> Cutler,<sup>81</sup> and Lenz<sup>82</sup> write on the x-ray treatment Thomson<sup>83</sup> writes on laryngofissure Chevalier Jackson and C. L. Jackson<sup>84</sup> state that malignant disease of the larynx is encountered in nine different forms (1) Squamous cell epithelioma, which is the commonest form and constitutes about 98 per cent of the cases, (2) basal-cell carcinoma, (3) glandular cell carcinoma, (4) endothelioma, (5) sarcoma, (6) malignant osteomyoma, (7) osteosarcoma, (8) a peculiar type of chondroma which destroys the entire larynx, and (9) precancerous conditions, potentially malignant, which are chiefly keratoses and leukoplakias

Laryngofissure has advanced to the point where eighty-two per cent of cures can be obtained provided the operation is limited strictly

to the type of case to which it is adapted. It affords operative access to the interior of the larynx by splitting the thyroid cartilage It is indicated in intrinsic cancer of limited extent whatever the type or degree of malignancy In cases in which the anterior wall of the arytenoid is involved, even though the growth has not yet become extrinsic, laryngofissure had better not be done if the malignancy is graded as III or IV If, however, the tumor is of Grade I or II laryngofissure is indicated In such cases it is necessary to remove all of the corresponding arytenoid cartilage If the growth has become even partially extrinsic by extension, it is beyond the limits of adequate removal by laryngofissure

Laryngectomy is indicated in, (a) cases of intrinsic cancer of the larynx that have extended so far posteriorly that there is a probability that laryngofissure will be inadequate and (b) extrinsic malignant disease of limited extent as of Grade I or II In every extensive growth of Grade I or II and in Grade III or IV growths irradiation is preferable to operation of any kind In patients with cardiovascular disease, tuberculosis, nephritis, and diabetes, it is, in many cases, advisable to trust to radiation rather than to risk a major operation such as laryngectomy Laryngofissure, on the other hand, is a relatively minor procedure and has few, if any, contraindications

Recurrences take place in about eighteen per cent of cases after laryngofissure and in about forty per cent of cases after laryngectomy for carcinoma of the larynx As a general rule irradiation by the Coutard technique is superior to further operation for these recurrences

Buckley<sup>85</sup> says that the operation called laryngectomy is no longer in its infancy, but is rather a well-established and recognized procedure, with many hundreds of cancer cures standing to its credit

To obtain the best results a preliminary biopsy is essential not alone definitely to establish a diagnosis but also to insure that very important microscopic study which is so necessary in deciding what therapeutic procedure shall be instituted

A series of laryngectomies seems to indicate that surgery still definitely stands out as the most powerful foe opposing cancer of the larynx

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subsidence to a large extent of the cervical glandular enlargement suggest that the adenitis was of inflammatory origin. Owing to their possible importance in the problem it is however, unfortunate that their size is not stated. As no mention is made of a biopsy and an exploratory thoracotomy was done, the inference may be drawn that they were not regarded as of special significance with respect to the thoracic condition.

DR TRACY B. MALLORY: Biopsy was attempted but no gland was found when they got in and only a bit of muscle was removed.

DR LORD: We have to consider certain inflammatory conditions, particularly tuberculosis. There is no evidence of glandular tuberculosis at the right root and negative intracutaneous tests with tuberculin up to and including one milligram are almost certain evidence against any active tuberculous process. Incidentally I may say that I do not think that any useful information is obtained by tests with highly diluted tuberculin. Tests in sequence with dilutions of 1:10,000, 1:1,000 and 1:100 are satisfactory.

Of other inflammatory conditions, actinomycosis may be mentioned, but more evidence of an inflammatory process may be expected. Though I have seen actinomycosis of the root of the lung with radiating projections into the neighborhood, I am inclined to dismiss it from serious consideration.

A third possibility is a sarcoid of Boeck, but as no lesions of the skin or mucous membranes are mentioned and so far as the lung is concerned the disease is likely to present a diffuse mottling in the lower and middle parts of the lung fields, I am inclined to dismiss that also.

Some sort of neoplasm is left for consideration. Of the benign newgrowths a dermoid cyst or neuroblastoma is likely to be more sharply outlined and without linear projections into the neighborhood. Of the two, only the dermoid is likely to be in the anterior part of the chest. I am inclined to exclude these two types of benign neoplasm.

A malignant newgrowth is left for consideration. Between carcinoma and lymphoblastoma the former is more likely though she is young for carcinoma. If carcinoma it is of the bronchobronchus type in view of the negative bronchoscopy. Some intimation of carcinoma is presented by the radioresistance of the mass. Then too there is some suggestion of bronchial occlusion with atelectasis from the high left diaphragm and the bulging upward of the interlobar septum.

Lymphoblastoma is difficult to exclude especially in the face of the enlarged cervical glands but I am inclined to regard these glands as of inflammatory origin. Then, too, lymphoblas-

toma is usually radiosensitive and the x-ray was without effect here.

In conclusion, I would say that I cannot make a distinction between carcinoma and lymphoblastoma but the chances seem in favor of carcinoma.

#### CLINICAL DISCUSSION

DR DONALD S. KING: At the time of her admission to this hospital this patient was in very good condition. A number of doctors who examined her thought that she was too well to justify operation. Tuberculosis was ruled out by the negative tuberculin test with a 1:100 dilution. The diagnosis of lymphoma was eliminated when the x-ray treatment had no effect. Almost everyone felt that the lesion was a tumor although we did have in mind a boy of about the same age who was thought to have had a tumor but whose operation showed a congenital cyst full of inspissated pus. His x-ray film differs from that of the patient under consideration because one can see the cyst containing air and pus. Occasionally a lung abscess with a gelatinous type of pus gives a shadow similar to that shown in the case of this cyst. We had this case in mind for comparison with the present case, but we did not feel justified in drawing the conclusion that the second case was cyst and not tumor. The preoperative diagnosis therefore was tumor and carcinoma seemed a definite possibility.

This postoperative film is interesting because although the supposed tumor mass has been removed, a large shadow persists in the region where the operation was performed. At the time of operation large inflamed glands were shown in this region and we believe that the shadow in this film is the result of these enlarged glands. This is the second case in which Dr. Churchill has taken out an upper lobe and left the lower lobe. It will be noted in the postoperative film that the lower lobe has now expanded and filled the entire region previously occupied by the upper lobe on this side.

#### PREOPERATIVE DIAGNOSIS

Benign tumor of the left lung

DR. FREDERICK T. LORD'S DIAGNOSES

Inflammatory cervical adenitis  
Malignant tumor of the lung (carcinoma)?

#### PATHOLOGIC DIAGNOSES

Cylindrical bronchiectasis of the major bronchi  
Pulmonary fibrosis  
Organized thrombosis of branches of the pulmonary artery

# CASE RECORDS of the MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED  
IN WEEKLY CLINICAL PATHOLOGIC EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACEY B. MALLORY, M.D., *Editor*

## CASE 22381

### PRESENTATION OF CASE

A fourteen year old native schoolgirl was admitted complaining of swelling of the neck glands.

The patient was perfectly well until six months before entry, when she developed a cold associated with a slight cough and nasal discharge. At the same time a swollen gland appeared beneath the left jaw. A physician advised bed rest and the patient remained in bed for two weeks, during which time both the cold and the swollen gland subsided. A month later the patient again caught cold and for the second time a gland appeared on the left side of the neck. During the succeeding few weeks the patient had a slight but persistent sore throat and a mild unproductive cough. The gland in the neck remained slightly tender. She improved and returned to her usual activities until two months before entry when exactly the same syndrome reappeared. This time she had some malaise and fatigability. She was sent to a sanatorium where x-rays revealed an increase in density and evidence of calcification in the right lung hilum. Extending outward from the left hilum into the parenchyma there was a large rounded area of increased density with an irregular margin. Subsequently the patient felt entirely well, the neck glands disappeared and she gained eight pounds. An intradermal tuberculin test was negative. She entered the hospital for study.

Physical examination showed a well-developed and nourished elderly looking young girl in no discomfort. The nose was clear and the throat negative. Discrete nontender nodes were palpated in both sides of the neck, in the angle of the jaws, and a few were felt in the left sternal mastoid and left supraclavicular regions. The lungs were negative. The heart was normal. The blood pressure was 125/75. The remainder of the examination was negative.

The temperature, pulse, and respirations were normal.

Examination of the urine was negative. The blood showed a red cell count of 5,000,000, with a hemoglobin of 85 per cent. The white cell

count was 6,000, 65 per cent polymorphonuclears. A stool examination was negative. Several tuberculin tests with dilutions of 1:40,000 to 1:100 were negative.

X-ray examination showed the left diaphragm to be slightly higher than the right but both sides moved equally and poorly. The heart was slightly rotated to the right and there was a 5 x 4 cm. area of dulness extending from the upper part of the hilum into the left upper lung field. It was ill defined and showed linear projections into the surrounding lung field. The remainder of the lung fields and the costophrenic angles were clear. The lateral view showed the area of dulness to lie in front of the plane of the trachea. It was well defined anteriorly but the outer margins were hazy. The lung markings of the upper lobe were slightly prominent and the interlobar septum seemed to bulge slightly upward.

A bronchoscopy showed a normal larynx. Examination of the bronchial tree was entirely negative except for slight redness of the upper lobe bronchus on the left side in which there appeared a small amount of mucoid secretion. The patient's condition remained relatively unchanged. On the nineteenth hospital day a series of x-ray treatments to the chest was instituted. This was completed in six days, and x-ray examination at that time and again a week later showed no appreciable change in the shadow. Three weeks later, on the forty-seventh hospital day, a left thoracotomy was performed.

### DIFFERENTIAL DIAGNOSIS

DR. FREDERICK T. LORD: The x-ray films are of interest from the statement that those taken elsewhere showed increased density and evidence of calcification at the right root. Calcification of intrathoracic glands, if present, may be taken to indicate tuberculosis. In these films the increased density at the right root does not exceed the normal. There are several round, homogeneously dense shadows in this region and beside one of them is a bronchus. I see no evidence of calcification and think the shadows at the right root are due to vessels on end rather than tuberculous glands.

The involved area on the left side lies in a plane in front of the trachea.

The history is rather brief and it would in addition be desirable to know if the patient still had cough and expectoration. As some bronchial secretion of a mucoid character was demonstrated by means of the bronchoscope, its examination would be desirable. We would like to know if she had shortness of breath, pain, wheezing, night sweats or chills, and the result of the Hinton test.

With respect to the physical examination, the succession of respiratory infections and the

A stool examination was negative. Hinton and tuberculin tests were negative. The basal metabolic rate was plus 2 and skin tests with echinococcus antigen were negative.

X-ray examination showed that the right diaphragm was slightly higher than the left and the right upper lung field contained a round mass measuring about 12 centimeters in diameter extending from the utmost tip of the lung field downward. It occupied the whole right chest in this region in the transverse diameter and almost the entire chest in the anterior posterior diameter. The esophagus was displaced to the left by the mass, which extended across the midline. There was no erosion of the ribs but there was questionable very slight erosion of the anterior aspect of some of the upper dorsal vertebrae. Laterally the mass blended with a shadow which accompanied the lateral chest wall. There was slight decrease in aeration of the lung on the right side. The heart was small and the lung fields were otherwise normal.

On the ninth hospital day the patient suddenly developed what appeared to be laryngeal obstruction which amounted to almost complete asphyxia. She was rushed to the operating room and an intratracheal tube was inserted through a laryngoscope. Marked edema of the glottis was noted. Some improvement ensued but the dyspnea again occurred on the following day. A tracheotomy was done and the posterior portions of the three right upper ribs were resected in order to decompress the thorax. She died on the fifteenth hospital day, four days after the thoracoplasty.

#### DIFFERENTIAL DIAGNOSIS

DR RICHARD H SWEET This is an interesting case because to me it illustrates a distinct clinical entity, that due to a tumor located in the thoracic inlet which causes pressure on the brachial plexus.

This is a young girl of eighteen. The outstanding presenting symptom was pain in the arm. That might mean almost anything. As I started to read the record I thought first of all of a cervical rib. We quickly see however that it is not that. Going through the history we find that she had a pain for months and then finally developed diminished strength in the arm and also numbness and tingling down along the course of the ulnar nerve. Later she had interosseous muscle contraction and some atrophy of the hypothenar muscles which confirms the diagnosis of interference with the ulnar nerve.

We note on physical examination that she lost weight. There are some very interesting findings also, such as absence of sweating on the right side of the face and a typical Horner's syndrome with exophthalmos and contracted pupils. The veins of the right neck were di-

lated suggesting pressure on the innominate or jugular vein on the right. There were also flatness to percussion and bronchial breathing over the upper part of the chest. She also had as you will see, some involvement of the intercosto humeral nerve because she had interference with sensation and pain along the inner side of the upper arm. It is interesting to observe that she had no cough, no sputum and no hemoptysis. In the laboratory examination the interesting facts are that the tuberculin test was negative, the Hinton was negative and the echinococcus complement fixation test was negative.

This picture is perfectly typical for the so-called superior sulcus tumor which was first described by Pancoast\* of Philadelphia. He says "The tumors in question seemed to occur at a definite location at the thoracic inlet, were characterized clinically by pain around the shoulder and down the arm, Horner's syndrome and atrophy of the muscles of the hand and presented roentgenographic evidences of a small homogeneous shadow at the extreme apex always more or less local rib destruction and often vertebral infiltration. Death occurred as a result of what seemed to be a comparatively trivial growth without detectable metastases roentgenologically. The tumors were differentiated from other neoplasms occurring in the neighborhood, such as apical primary lung carcinoma and sarcoma of the ribs, by the absence of one or more of the foregoing characteristic manifestations."

Then we read the x-ray report and find that she has a large tumor in the upper part of the chest. There is no rib destruction but there is some vertebral destruction.

DR GEORGE W HOLMES Of course the tumor is large. There is no evidence of rib or bone destruction which is quite important, even if this was an aneurysm you would expect some erosion of the sternum or the ribs in front. It has displaced the esophagus and trachea. In this straight lateral view it is evident that the mass extends almost across the upper part of the chest a little more forward than backward but I really think must arise from the middle mediastinum.

This is the oblique view, but it does not rule out a mass arising from the aorta. However, I think aneurysm is very unlikely from the character of the x-ray.

DR SWEET The history is perfectly typical of a Pancoast tumor but as Dr Holmes says, the x-ray is not, because this is a much larger tumor than any of the ones we have called superior sulcus tumors.

The final course is interesting because she developed obstruction from the tumor with pres-

Pancoast, Henry K. Superior pulmonary sulcus tumor. J. A. M. A. 9: 1391 (Oct. 2) 1904.

## PATHOLOGIC DISCUSSION

DR MALLORY The specimen which we received was the upper lobe of the lung, and close to the hilum there was a cavity of considerable size from which in the course of operation I believe Dr Churchill liberated a good deal of inspissated pus, such as Dr King has described. There was no pus in it when it reached us. It appeared to be a marked dilatation of the main bronchus to the lobe and its first two subdivisions. If that was the case I do not see why the bronchoscopy was reported as negative. The lung in the surrounding hilar region showed a very extensive grade of pneumonitis and fibrosis which must have produced part of the very dense shadow. The lung beyond that point was atelectatic. There was no evidence of an infectious process in the peripheral part of the lung and the border of the very intense and fibrotic process in the hilar region was sharp. There were also several quite large branches of the pulmonary artery which were completely thrombosed. I do not see any way in which one can guess whether that thrombosis was secondary to pulmonary inflammation or whether it might not have been the other way that the thrombosis was primary and the localized area of destruction of the lung secondary.

If the structure was in the nature of a congenital cyst one must assume that there developed a secondary inflammatory process later and I was more inclined to regard it as an atypical form of cylindrical bronchiectasis limited to the major bronchi.

DR KING It was different from this other cyst?

DR MALLORY Yes. The bronchial cartilages found in the wall of the cyst showed extensive bone formation which is a very common thing in elderly people but most unusual in a girl of fourteen suggesting that a degenerative process had been going on for quite a number of years.

## CASE 22382

## PRESENTATION OF CASE

An eighteen year old white girl was admitted complaining of pain in the right arm.

Ten months before coming to the hospital the patient began to have a rather constant dull aching pain in the right arm. There were no acute exacerbations, nor did the pain interfere with her sleep. Initially there was no disturbance of motility of the extremity. About five months prior to entry, the pain became quite severe and necessitated the administration of codein. She was hospitalized for four days, during which time she was found to have a daily afternoon temperature of 100°. She was told that there was fluid in the right chest

but was treated only with ice packs and medication. Following her discharge she remained in bed for about one month, during the first few days of which she could not move her right arm. Subsequently her fever subsided but the aching pain in the arm returned and she took codein quite regularly for it. Three months before admission she was examined at a sanatorium and told that she had no evidence of tuberculosis. Three weeks before entry the pain again became severe and she noted diminished strength in the affected arm. There was a sensation of numbness along the inner aspect of the arm from the axilla to the hand, and the fourth and fifth fingers on that side were quite weak. She lost thirteen pounds during the three months preceding her entry.

Physical examination showed a well developed but slightly undernourished girl in no acute discomfort. The skin over the left side of the face and neck was moist but that on the right side was dry. The right palpebral fissure was narrower than the left and the right pupil smaller. The retinal veins were distended bilaterally. The anterior jugular vein was more prominent on the right side and the superficial veins over the upper right thorax and lower neck exhibited increased prominence also. The trachea was displaced to the left and a questionable mass was palpated behind the medial half of the right clavicle and sternal notch. There was slight scoliosis to the left in the upper dorsal region and slight respiratory lag of the right upper chest. The right breast was slightly larger than the left. There was flatness anteriorly from the supraclavicular notch down to the first interspace and distinct bronchial breathing was audible in this region. Tactile fremitus and vocal resonance were also diminished in the same region. Posteriorly from the supraspinous fossa to the level of the third rib similar signs were elicited. The heart was normal and the blood pressure was 100/70 in both antecubital fossae. The abdomen was negative. The right palm was dry and somewhat scaly and there was atrophy of the small muscles of this hand. The right forearm was smaller than the left and the patient was unable to grip with the right hand. She was also unable to extend the third, fourth and fifth fingers of this hand. An area of anesthesia was demonstrated from the axilla down to the medial aspect of the arm, including the fourth and fifth fingers and the lateral portion of the third. Deep reflexes were all present but slightly less active in the right upper extremity.

The temperature, pulse and respirations were normal.

Examination of the urine was negative. The blood showed a red cell count of 5,200,000, with a hemoglobin of 80 per cent. The white cell count was 7,400, 74 per cent polymorphonuclears.

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## STERILIZATION OF THE UNFIT

LIKE so many steps in our progress toward Utopia the theory and practice of sexual sterilization of human beings do not go hand in hand. Few would refuse to admit, even on moral grounds, the advantages of preventing the propagation of the mentally unfit. The care of the mentally defective and those individuals suffering from the more serious forms of mental disease places an ever increasing burden on the taxpayers and, theoretically at least is a failure in modern eugenics. Must we continue along the same path as in the past or is there an effective remedy at hand which will lead us to the end, that all men shall have a sound mind in a sound body? Before the problem can be solved we must look at the facts as we visualize them today.

Only a very small percentage of mental disease or defect is definitely and unquestionably hereditary. Idiots and imbeciles often are the product of normal parents who have normal children both before and after the birth of the de-

fective. It must be admitted, moreover, that defective persons have propagated normal and even supernormal, children. Who is to say that the moronic father may not have a genius in his loins? Although the chances of such are obviously small, the fact cannot be overlooked that persons who have been of great use to the world have been born of unstable and even defective parents. The decision to sterilize a defective is not one that the state is ready to assume, except on voluntary application. This, naturally, in many cases, the defective cannot, or is not in a position, to make. It would seem best, on the whole, for society to pocket the loss entailed in custodial care, especially in view of the possibility of a hidden asset of a superior individual which might be also lost. In most cases nature kindly prevents conception and our troubles are not so grave as they appear. It is only in a few cases that the advantages of sterilization of the defective appear to be important. Morons, both male and female are often easily excited sexually and, in addition, lack the moral control vested in most people of sound mind. Confinement of these in hospitals and schools is considered obligatory. If sterilized this small class might find some useful pursuit outside of an institution. The gain, either from the economic or the social aspect would, however, be small. It must be remembered that there are other crimes than sexual, that can be committed by people of feeble mentality. The taxpayer might easily find that his bill for crimes of other sorts more than offset the cost of institutional care. The problem thus might become greater than that created by sexual sterilization.

If we cannot justify or urge sterilization of the mental defective, we have even less grounds for the procedure in mental disease. In a recent survey by the American Neurological Association, only one disease and that exceedingly rare, was shown to be unmistakably hereditary. The Commission that made the prolonged investigation, moreover felt that even this disease might occasionally not be passed from parent to child. If these facts are so, and we have no reason to doubt them in what patients with mental disease could sterilization be made mandatory by law?

Common sense points to only one conclusion. Until we know more about mental disease and mental defect laws to prevent propagation by sterilization are unwise. The problem is not so simple as smallpox vaccination, where lawful protection of the communities is overwhelmingly favored as a justifiable act. In the case of mental disease or defect we still must know more in regard to hereditary mechanisms, before such drastic action as mandatory sexual sterilization should appear on our statute books.

sure on the trachea, although they attempted to relieve it by decompressing the upper part of the tumor. She finally died.

I think this is an interesting case because it brings out the clinical syndrome that we associate with malignant tumors in the apex of the lung, with early involvement of the lower cords of the brachial plexus. What the histology is I do not know, but I should rather guess it showed carcinoma. Of course the apex of the chest cavity is a location where we sometimes have a neurofibroma which should be mentioned in the differential diagnosis. We must admit in considering the diagnosis of carcinoma that this is a rather large tumor to go without causing bleeding or other evidence of malignant disease, but I should be inclined nevertheless to guess that it is a case of carcinoma of the lung.

#### CLINICAL DISCUSSION

DR JOHN D STEWART I do not think there is any particular point in discussing the operation in detail. She developed this sudden respiratory obstruction and all that we intended to do was to take away enough of the bony thorax so that the tumor could extend upward instead of pressing against the trachea, and although she was relieved somewhat I do not believe she was helped very much.

There is one point in the symptomatology that I would like to speak of. I saw this woman on the ward about a day or so before this sudden respiratory obstruction developed and she had the same symptom that was described in the first case that we took up today,\* that is, she could breathe much more easily lying down than she could sitting up. This was quite striking. Her breathing in bed seemed apparently entirely free but the moment you asked her to sit up it became very difficult for her to breathe which, I presume, means it was entirely a matter of mechanical compression of the trachea or bronchi, the pressure being relieved somewhat by change of posture.

#### CLINICAL DIAGNOSES

Preoperative Tumor of the lung  
Postoperative Neurofibroma of the mediastinum  
Mediastinal edema  
Tracheobronchitis  
Bronchopneumonia

#### DR RICHARD H SWEET'S DIAGNOSES

Carcinoma of the lung, "superior sulcus tumor" type

#### ANATOMIC DIAGNOSES

Fibrosarcoma of the mediastinum, probably neurogenic

Compression of the trachea  
Acute tracheitis and bronchitis  
Bronchopneumonia  
Thrombosis of the right jugular vein  
Congenital anomaly—five lobes of right lung  
Operative wounds Tracheotomy, exploratory thoracotomy

#### PATHOLOGIC DISCUSSION

DR TRACY B MALLORY The autopsy on this patient showed a very large tumor occupying the upper portion of the pleural cavity and displacing the upper lobe of the right lung. It was not entirely apparent at the autopsy from what portion of the mediastinum it actually arose. It certainly did not come from the thymus. That was identified and proved negative. In all probability it came from the posterior mediastinum though it had infiltrated diffusely enough so that we were not able to be absolutely certain about that. It certainly did involve the sympathetic chain and the lower nerves of the brachial plexus, as the clinical symptomatology told us that it must. The jugular vein on that side also proved to be thrombosed. A great deal of interference with return of venous circulation from the head and occasionally from the upper extremities is common in these tumors that are placed right in the thoracic outlet. The dyspnea was obviously due to a marked compression of the trachea. In the last hours of life a significant amount of bronchopneumonia developed.

The biopsy of the tumor removed at the time of the emergency operation showed two types of cells. The majority were huge oval and spindle shaped cells, but little clusters of cells were also found that looked epithelial. At autopsy we had an opportunity to take many more sections but these showed only the spindle cell variety. When we originally found two types of cells present we thought we were dealing with teratoid tumor. The autopsy has failed to back that diagnosis up, and I think we now have to make a diagnosis of fibrosarcoma, again presumably of neurogenic origin.

An interesting finding at the autopsy was the discovery of a congenital anomaly of the right lung, which was divided into five well marked lobes. This had of course no direct bearing on the symptomatology of the case but it might well have caused the surgeon considerable perplexity if he had been in a position to attempt a lobectomy.

A PHYSICIAN Was there any evidence of metastasis?

DR. MALLORY No, the immediate lymph nodes were enlarged but they are negative microscopically.



lishers of this distinctly useful volume have been forced to give it up

Although the information available in the *Boston Medical Blue Book* was much more complete than that included in the *American Medical Directory*, there seems to be a distinct and urgent need for a small volume containing data, such as that furnished by the latter, on the practicing physicians of the larger cities or of the individual states. Would it not be advantageous to both physicians and the American Medical Association for the latter to reprint city and state sections from the *American Medical Directory*?

### A GOOD APPOINTMENT

THE *Journal* is gratified to note that His Excellency Governor Curlew has submitted for reappointment the name of Samuel Kalesky of Boston as Associate Commissioner of the Department of Mental Diseases. Mr Kalesky has served for four years in this important although unpaid position and has rendered a genuine service to the Commonwealth and to the mentally ill in this capacity.

The medical profession of the Commonwealth will we hope correctly interpret this reappointment by His Excellency as indicating a desire not to interfere with the policies of the Department of Mental Diseases, and will take hope from this reappointment that His Excellency may in the near future give further evidence of his interest in the welfare of the mentally ill by the reappointment of the present Commissioner of the Department Dr Winfred Overholser.

### THIS WEEK'S ISSUE

CONTAINS articles by the following named authors

HARRISON TINSLEY R. M.D. For information see This Week's Issue page 507, issue of September 10. His subject is The Principles of Therapy in Patients with Congestive Heart Failure. Page 517. Address 403 Wilson Blvd South Nashville Tenn.

SIMMONS CHANNING C. M.D. Harvard University Medical School 1899. F.A.C.S. Visiting Surgeon Massachusetts General Hospital. Surgeon-in-Chief Collis P. Huntington Memorial Hospital. Address 205 Beacon Street Boston Mass. Associated with him are

TAYLOR, GRANTLEY W. A.B., M.D. Harvard University Medical School 1922. F.A.C.S. Assistant in Surgery. Harvard University Medical School. Assistant Surgeon Massachusetts General Hospital. Surgeon to Out-Patients Palmer Memorial Hospital. Surgeon Collis P. Huntington Hospital. Visiting Surgeon House

of the Good Samaritan Visiting Surgeon, Pondville Hospital at Norfolk Wrentham Consulting Surgeon, Massachusetts Eye and Ear Infirmary. Address 264 Beacon Street, Boston Mass. And

ADAMS HERBERT D. A.B., M.D. Harvard University Medical School 1929. Assistant Surgeon Massachusetts General Hospital and Palmer Memorial Hospital. Assistant Surgical Adviser Harvard College. Address 66 Commonwealth Avenue, Boston Mass. Then subject is Cancer of the Breast. End-Results, Massachusetts General Hospital, 1927, 1928 and 1929. Page 521.

WOODWARD SAMUEL B. A.B. M.D. Harvard University Medical School 1877. President, Massachusetts Medical Society 1916-1919. His subject is An Address to the Staff of the Worcester City Hospital. Page 526. Address 58 Pearl Street, Worcester, Mass.

SPRING JOHN D. A.B., M.D., C.M. McGill University Faculty of Medicine 1930. On Staff of Memorial and St Joseph's Hospitals, Nashua, N.H. His subject is Artificial Pneumothorax in the Treatment of Tuberculosis. Page 530. Address 135 Main Street, Nashua, N.H.

STONE SIMON. M.D. Tufts College Medical School 1930. D.N.B. 1934. Chief of Admission and Medical Units New Hampshire State Hospital Concord N.H. Attending Psychiatrist, Manchester Mental Hygiene Clinic Manchester, N.H. His subject is Sexual Sterilization in New Hampshire. Page 536. Address New Hampshire State Hospital, Concord, N.H.

SCHALL LEROY A. M.D. Jefferson Medical College 1917. Surgeon Massachusetts Eye and Ear Infirmary. Assistant Laryngologist at Robert B. Brigham, Palmer Memorial and Collis P. Huntington Memorial Hospitals. Consultant, United States Marine Hospital No. 2. Consultant, Tumor Clinic, Boston Dispensary. Instructor in Laryngology, Harvard University Medical School. Address 270 Commonwealth Avenue Boston, Mass. Associated with him are

RICHARDSON JOHN R. A.B. M.D. Harvard University Medical School 1931. Clinical Assistant, Massachusetts Eye and Ear Infirmary. Assistant Laryngologist Newton Hospital. Teaching Assistant in Laryngology, Harvard University Medical School. Address 395 Commonwealth Avenue Boston, Mass. And

MUELLER WERNER S.B. M.D. Boston University School of Medicine 1930. Clinical Assistant, Massachusetts Eye and Ear Infirmary. Assistant in Laryngology, Courses for Graduates, Harvard University Medical School. Address 395 Commonwealth Avenue, Boston, Mass. Their subject is Progress in Laryngology. Page 546.

## A SUIT AGAINST A PHYSICIAN

A WOMAN appealed to her family physician for advice as to the proper procedure, alleging that her husband had threatened to shoot her and in connection with the threat had exhibited a revolver.

The doctor brought the matter to the attention of the local judge and this physician and an associate were appointed to examine the husband and submit a report to the judge. On the receipt of the medical report the judge committed the husband to one of the State hospitals for mental diseases for observation. When taken into custody by the police officer for the purpose of delivering him to the hospital, an unloaded revolver was found on the person of the patient.

After several weeks' observation in the hospital the patient was discharged as *not insane*.

The husband has now brought suit against the doctor who was appealed to by the wife, including in the declaration that "the defendant maliciously devising and intending to injure the plaintiff did on the sixth day of May 1933 falsely and maliciously and without any reasonable and probable cause make an application for his commitment to a hospital for the insane."

In the declaration it is further charged "that the defendant, well knowing that the plaintiff was sane, caused an assault with force and arms to be made upon the plaintiff and caused him then and there to be taken and imprisoned and restrained."

Next comes an interesting feature of the case, especially to physicians, because the doctor carried indemnity insurance with the United States Fidelity and Guaranty Company for his protection in claims for malpractice. This company declines to acknowledge liability in a suit for malpractice in this case with the statement, "You will observe that the claim is that you acted falsely, maliciously and wilfully to have the plaintiff committed" and further "This is entirely different from a charge of malpractice, error or mistake" and reference is made to a decision of the Massachusetts Supreme Judicial Court in the case of *Niver v. Boland* 177 Mass. 11.

The letter of the United States Fidelity and Guaranty Company disclaims any responsibility under its policy for any judgment against the doctor. Even so, the Company is willing to have its attorneys conduct the defense, but does not state how much would be charged for this service.

The next reasonable move is for the doctor to consult the proper officers of the Massachusetts Medical Society, under his rights as a member, for the Society will provide legal advice and court service for the purpose of conducting defense when a member is accused of

malpractice or illegal transactions in connection with the commitment of persons to institutions for the insane.

To us it seems that the decision of the United States Fidelity and Guaranty Company and of any law rests on the interpretation of words rather than facts, for the doctor in this case was appointed by the court to use his knowledge and experience as a physician in making a diagnosis and he made his report purely as a physician. If his report was unsound or the result of prejudice or enmity it seems reasonable to interpret that as *malpractice*, for Webster defines malpractice as "wrongful or negligent practice or action especially in professional or fiduciary conduct." The doctor was acting in both respects because he was giving a professional opinion and, on appointment by the court had definite fiduciary responsibilities. We concede that no layman is competent to quarrel with an opinion of the Massachusetts Supreme Court, but this situation raises the question of the quality of service under insurance policies supposedly protecting physicians in the exercise of their functions, and the doctor should ascertain exactly how far the service is protective.

## MEDICAL DIRECTORIES

THE Arkansas Medical Society in April of this year adopted a resolution condemning the listing of physicians in insurance medical directories. It was maintained that participation by listing in such commercial publications technically constituted indirect solicitations of patients, and the resolution branded the practice as unethical and forbade the listing of its members. The resolution was presented to the House of Delegates of the American Medical Association, was approved by the Judicial Council and adopted by the House of Delegates on May fourteenth.

In certain legitimate medical activities an accurate and comprehensive medical directory is almost invaluable. To be sure, lists are published by the majority of the state societies, but these rarely, if ever, contain little beyond the office and home address of the physician. The *American Medical Directory*, published by the American Medical Association, gives somewhat more detailed information, but the volume, listing as it does all registered physicians in these United States and Canada, covers much more ground than is necessary for the large majority of prospective users. Furthermore, it is expensive, though not unreasonably so.

Some years ago the *Boston Medical Blue Book* was to be found on the desks of many practitioners in and about Boston. Although a commercial publication the participants in the listing were never accused of being unethical, and to many it has seemed unfortunate that the pub

On Tuesday and Wednesday afternoons members of the Congress will meet for a social hour at the New Haven Medical Association

The Women's Medical Society of Connecticut will meet for luncheon at 12 45 p m on Wednesday, September 23 at the Dutch Treat Tea Room Dr Leda Stacy of White Plains will be the guest speaker All medical women are welcome

## OBITUARY

### THE DEATH OF LORD MOYNIHAN

On September 7, 1936 Baron Berkeley George Andrew Moynihan died six days after his wife whom he married in 1895 He collapsed the day after her funeral and did not respond to efforts to sustain him

Lord Moynihan was born in Malta the son of a captain in the King's Regiment He held honorary degrees from Oxford Durham Leeds Edinburgh, Bristol St. Andrews McGill Toronto Winnipeg, Ghent, Buenos Aires Dublin Calro and Belfast and during the World War was brevetted Colonel He was Emeritus Professor of Surgery at the University of Leeds From 1926 to 1932 he was President of the Royal College of Surgeons and was Senior Consulting Surgeon of the Royal Army Corps of the British Army

In 1917 he came to the United States to assist this country in creating and training the Medical Corps

Lord Moynihan was especially prominent in the treatment of cancer and diseases of the abdominal organs Many American surgeons made pilgrimages abroad to visit Lord Moynihan's Clinics for he was recognized as one of the leading surgeons of recent years

## NOTICES

### THE EDWARD K. DUNHAM LECTURESHIP

In 1923 there was founded in memory of Dr Edward K. Dunham (M.D. Harvard 1886), the Edward K. Dunham Lectureship for the Promotion of the Medical Sciences Among the useful purposes for which the Foundation was established was that of binding closer the bonds of fellowship and understanding between students and investigators in this and foreign countries The lecturers are chosen from eminent investigators and teachers in one of the branches of the Medical Sciences or of the basic Sciences which contribute towards the advance of Medical Science in the broadest sense The lectures which are given annually are free and open to the faculty and students of the Harvard Medical School and College and all other interested professional persons who may profit by them

The Faculty of Medicine of Harvard University has announced that two lectures will be given under

the Edward K. Dunham Lectureship for the Promotion of the Medical Sciences on 'The Significance of Catalysis in Biology'

Tuesday October 6 'The Catalytic Equipment of Micro-organisms'

Thursday October 8, 'The Nature of Biocatalytic Systems in General'

At five o'clock at the Harvard Medical School Amphitheater Building C

By Sir Frederick Gowland Hopkins M.D. D.Sc., LL.D. Professor of Biochemistry, University of Cambridge

### TWENTY-FIRST INTERNATIONAL ASSEMBLY OF THE INTER-STATE POSTGRADUATE MEDICAL ASSOCIATION

The twenty-first International Assembly of the Inter-State Postgraduate Medical Association of North America under the presidency of Dr David Riesman of Philadelphia Pennsylvania will be held in the public auditorium of St. Paul Minnesota October 12, 13, 14, 15 and 16 with pre-assembly clinics on Saturday, October 10 and post-assembly clinics Saturday October 17 in the hospitals of St. Paul (Detailed program appears on page 566)

The aim of the program committee with Dr George Crile as chairman is to provide for the medical profession of North America an intensive postgraduate course covering the various branches of medical science The program has been carefully arranged to meet the demands of the general practitioner as well as the specialist. Extreme care has been given in the selection of the contributors and the subjects of their contributions

In co-operation with the Minnesota State Medical Association the Ramsey County Medical Society will be host to the Assembly and has arranged an excellent list of committees that will function throughout the Assembly

A most hearty invitation is extended to all members of the profession who are in good standing in their State or Provincial Societies to be present and enjoy the hospitality of the medical profession of St. Paul A registration fee of \$5.00 will admit each member of the medical profession in good standing to all the scientific and clinical sessions

It is of interest to note that the work of this Association has been endorsed by Dr Charles H. Mayo Dr Henry A. Christian Dr Arthur D. Bevan Dr Lewellys F. Barker Dr William D. Haggard Dr George Crile Dr Edward Archibald Dr Archibald Young and Mariano R. Castex.

A list of the distinguished teachers and clinicians who will take part in the program may be found on page 566

Special railroad rates will be in effect.

For further information write Dr W. B. Peck, Managing Director, Freeport, Illinois

## MISCELLANY

TWELFTH ANNUAL CLINICAL CONGRESS OF  
THE CONNECTICUT STATE MEDICAL SOCIETY

A twenty five per cent increase in early registrations indicates increased interest on the part of physicians in Connecticut and neighboring states in the Annual Clinical Congress of The Connecticut State Medical Society which will be held in New Haven on Tuesday Wednesday and Thursday September 22 23, and 24. It is anticipated that last year's attendance of over six hundred will be surpassed. The registration fee for the entire Congress is \$2.00. Morning sessions which will be held in the Auditorium of the Sterling Law Buildings will begin at 9:30 a. m., daylight saving time. Afternoon sessions will be held in the buildings of the New Haven Hospital and the Yale School of Medicine. They will begin at 2:15 p. m., daylight saving time. Evening sessions, which will also be held at the New Haven Hospital and the School of Medicine, will begin at 8:15 p. m. daylight saving time. The evening meetings have been arranged by the various special sections of the society but are open to all members of the Congress.

On Tuesday morning with Dr Stanhope Bayne-Jones, Dean of the Yale School of Medicine, presiding Dr Frederic W Bancroft of New York will speak on 'Our Duty to the Fracture Patient'. Dr Burrill B Crohn will speak on 'The Etiology, Treatment and End Results of Gastro-Duodenal Ulcer'. Dr Foster Kennedy of New York will speak on "What the General Practitioner Should Know about Neurology" and Dr Thomas M Rivers of New York on 'Poliomyelitis'. In the afternoon these same speakers will hold bedside clinics. Dr Bancroft will present 'The Surgical Aspect of a Case of Essential Hypertension'. Dr Crohn will present a Case of Colitis and Dr Kennedy a Case of Encephalitis. Following these there will be Panel Discussions at which questions pertinent to the papers read in the morning will be discussed by a panel of physicians from various parts of the state. Dr Carl W Henze of New Haven will preside at the symposium on the Treatment of Fractures. Dr Robert F Scholl of New Haven at the symposium on Peptic Ulcer, Dr Otto G Wiedman of Hartford at the symposium on Neurology and Dr Alfred Labensky of New London at the symposium on Poliomyelitis. In the evening the Section on Eye, Ear, Nose and Throat with Dr Walter L Hogan of Hartford presiding will hear Dr Perry G Goldsmith of Toronto speak on 'Acute and Chronic Upper Respiratory Inflammation', the Section on Neurology and Psychiatry with Dr Daniel P Griffin of Bridgeport presiding will hear Dr Abraham Myerson of Boston speak on 'The Neuroses', the Hezekiah Beardsley Pediatric Club with Dr Howard W Brayton of Hartford presiding will hear Dr Louis K Diamond of Boston speak on 'The Role of Iron in the Nutrition of the Young' and the Section on Cardiology with Dr

Louis H Nahm of New Haven presiding will hear Dr Howard B Sprague speak on 'The Progress of Cardiology During 1935-1936'.

On Wednesday morning Dr Daniel C Patterson of Bridgeport the President of the State Medical Society will preside. Dr Louis G Herrmann of Cincinnati will speak on 'Recent Advances in the Diagnosis and Treatment of Peripheral Vascular Diseases'. Dr Vilray P Blair of St. Louis will speak on 'Injuries of the Bones and Soft Tissues of the Face'. Dr Warren T Vaughan of Richmond on 'Recent Advances in the Study of Food Allergy' and Dr Walter T Dannreuther of New York on 'The Clinical Manifestations of Ectopic Gestation'. In the afternoon Dr Herrmann will present a Case of Raynaud's Disease, Dr Blair a Case of Cancer of the Mouth, Dr Vaughan a Case of Migraine and Dr Dannreuther a Case of Fibroid Tumors of the Uterus. The symposium on Peripheral Vascular Disease will be presided over by Dr Ashley W Oughterson of New Haven. The symposium on Injuries to the Bones and Soft Tissues of the Face by Dr William F Verdi of New Haven, the symposium on Food Allergy by Dr Howard S Colwell of New Haven and the symposium on Gynecology by Dr Luther Musselman of New Haven. In the evening the Section on Radiology with Dr Harold R Lockhart of Bridgeport presiding will hear Dr Richard Dresser of Boston speak on 'The Radiological Management of Cancer of the Breast', the Section on Dermatology and Syphilology with Dr Maurice J Strauss of New Haven presiding will hear Dr M B Sulzberger of New York speak on 'Recent Developments in the Diagnosis and Treatment of Diseases of the Skin' and the Section on Obstetrics and Gynecology with Dr Hartwell G Thompson of Hartford presiding will see a motion picture depicting 'Operative Obstetrical Procedures' presented by Dr Emerson L Stone of New Haven.

On Thursday morning with Dr Daniel Sullivan of New London presiding, Dr Leonard Greenburg of New York will speak on 'The Practicing Physician and the Diagnosis and Treatment of Occupational Diseases' and Dr Edwin H Place of Boston will speak on 'Salient Experiences in Thirty Years of Contagious Disease Practice'. This will be followed by a Panel Discussion on 'Endocrinology of Today'. Dr Roy G Hoskins of Boston will be the chairman of this panel and the other members will be Dr Fuller Alhright of Boston, Dr Edgar Allen of New Haven, Dr Earl Engle of New York, Dr Max A Goldzieher of New York, Dr Raphael Kurzrok of New York and Dr Elmer L Sevringhaus of Madison Wisconsin. In the afternoon Dr Edgar Mayer of New York will present a Case of Silicosis, Dr Alhright a Case of Parathyroid Disease, Dr Goldzieher a Case of Pituitary Obesity, Dr Kurzrok a Case of Primary Amenorrhea and Dr Sevringhaus a Case of Diabetes. Dr Arthur B Dayton of New Haven will preside at the symposium on Industrial Diseases and Dr Joseph I Linde at the symposium on Immunity Procedures in Acute Infections.

Address Tumors of the Bladder

Dr Hugh H Young Professor of Urology Johns Hopkins University School of Medicine, Baltimore Md

Intermission for Review of Exhibits

Address (Subject to be supplied)

Dr Francis J Charteris MD ChB Professor of Materia Medica and Therapeutics St Andrews University School of Medicine, St Andrews, Scotland

Address Factors Frequently Overlooked in the Management of the Patient with Heart Disease

Dr Charles A Elliott, Professor of Medicine Northwestern University School of Medicine Chicago Ill

Address The Diagnosis of Intra Cranial Complications of Oral and Nasal Sinus Suppuration

Dr Wells P Eagleton OALR Newark New Jersey

Address Treatment of Acute and Chronic Mastoiditis

Dr Matthew S Ersner Professor of Otolaryngology Temple University School of Medicine Philadelphia Pa

Dinner Intermission

7 00 p m

Address The Consideration and Management of Some of the More Common Congenital Deformities of the Rectum

Dr Vernon C David Clinical Professor of Surgery Rush Medical College Chicago, Ill

Address The Diagnosis and Treatment of Tumors of the Bladder by Means of the Roentgen Rays

Dr George E Pfahler Professor of Radiology University of Pennsylvania Graduate School of Medicine Philadelphia Pa

Address The Cerebral Regulation of Autonomic Function

Dr John F Fulton Sterling Professor of Physiology Yale University School of Medicine New Haven Conn

Address Syphilis of the Heart and Blood Vessels

Dr Maurice C Pincoffs Professor of Medicine University of Maryland School of Medicine Baltimore Md

Address The Management of Intestinal Obstruction

Dr Owen H Wangenstein Professor of Surgery University of Minnesota Medical School Minneapolis Minn

WEDNESDAY OCTOBER 14

8 00 a m.

Diagnostic Clinic Paralysis in Children

Dr Bronson Crothers Assistant Professor of Pediatrics Harvard University Medical School Boston Mass

Diagnostic Clinic Carcinoma of the Stomach

Dr Donald C Balfour Professor of Surgery University of Minnesota Graduate School of Medicine Rochester Minn

Diagnostic Clinic Economic Advantages of Early Protected Weight Bearing in Fractures of the Leg Foot and Ankle

Dr Fraser B Gurd McGill University Faculty of Medicine Montreal Canada

Intermission for Review of Exhibits

Diagnostic Clinic Essential Hypertension

Dr Alfred W Adson Professor of Neurosurgery University of Minnesota Graduate School of Medicine

and

Dr E V Allen Assistant Professor of Medicine University of Minnesota Graduate School of Medicine Rochester Minn

Diagnostic Clinic Bodily Type in Relation to Endocrine Function

Dr Charles R Stockard Professor of Anatomy Cornell University Medical College New York N Y

Noon Intermission

1 p m

Diagnostic Clinic The Nature and Management of Nephritic Edema

Dr Louis H Newburgh Professor of Clinical Investigation in Internal Medicine University of Michigan Medical School Ann Arbor Mich

Address Circulatory Failure in Acute Infectious Diseases

Dr William R Williams Professor of Clinical Medicine Cornell University Medical College New York N Y

Address 'Genesis and Surgical Treatment of Essential Hypertension

Dr George Crie, Cleveland Clinic Cleveland Ohio

Intermission for Review of Exhibits

Address Relation of Diseases of the Sinuses to Organic Disease

Dr Robert F Ridpath Professor of Laryngology and Rhinology Temple University School of Medicine Philadelphia Pa

Address 'Intrathoracic Goiter

Dr Charles G Heyd Professor of Clinical Surgery New York Postgraduate Medical School New York N Y

Address Non-Surgical Diseases of the Colon

Dr Joseph W Larimore Associate Professor of Clinical Medicine Washington University School of Medicine, St Louis Mo

Address 'The Sella Turcica

Dr Eric Oldberg Professor of Neurology and Neurological Surgery University of Illinois College of Medicine Chicago Ill

ASSEMBLY DINNER

For members of the profession  
their ladies and friends

Informal

7 00 p m

Dr Charles H Mayo Master of Ceremonies

## NOTICE OF MEETING

### INTERNATIONAL MEDICAL ASSEMBLY INTERSTATE POSTGRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA

OCTOBER 12, 13, 14, 15, 16, 1936

Pre Assembly Clinics, October 10

Post Assembly Clinics, October 17

St Paul Hospitals

ST PAUL, MINNESOTA

MONDAY OCTOBER 12

8 00 a m

Diagnostic Clinic 'Coronary Thrombosis and Angina Pectoris'

Dr Fred M Smith Professor of Theory and Practice of Medicine State University of Iowa College of Medicine Iowa City Iowa

Diagnostic Clinic 'Diseases of the Thyroid Gland'  
Dr Robert S Dinsmore, Cleveland Clinic, Cleveland Ohio

Diagnostic Clinic "Rheumatoid Arthritis"  
Dr Russell L Haden, Chief of Medical Division Cleveland Clinic, Cleveland, Ohio

Intermission for Review of Exhibits

Diagnostic Clinic 'Trigeminal Neuralgia'  
Dr Francis C Grant, Assistant Professor of Neurological Surgery, University of Pennsylvania School of Medicine, Philadelphia, Pa

Diagnostic Clinic 'Surgical Treatment of Diseases of the Biliary Tract'

Dr Waltman Walters, Associate Professor of Surgery University of Minnesota Graduate School of Medicine, Rochester Minn

Noon Intermission

1 00 p m

Address 'Obstetric Hemorrhages and Their Treatment'

Dr Jennings C Litzenberg Professor of Obstetrics and Gynecology, University of Minnesota Medical School Minneapolis, Minn

Address 'Relation of the Endocrine Glands to Sterility'

Dr Emil Novak Associate Professor of Obstetrics, University of Maryland School of Medicine, Baltimore Md

Address 'Diffuse Adenomatosis of the Colon'

Dr Fred W Rankin, Lexington, Kentucky

Intermission for Review of Exhibits

Address 'Treatment of Diabetes during Surgical Emergencies'

Dr Herman O Mosenthal, Professor of Clinical Medicine, New York Postgraduate Medical School New York N Y

Address 'Problems in the Diagnosis of Diabetes'

Dr Robert D Lawrence MA MD FRCP, Physician to Kings College Hospital Diabetic Department, London England

Address 'Neurological Surgery'

Dr Loyal Davis, Professor of Surgery Northwestern University School of Medicine, Chicago Illinois

Dinner Intermission

7 00 p m

Address Endocrine Disorders in Childhood

Dr Frederick W Schlutz, Richard T Crane Professor of Pediatrics, University of Chicago School of Medicine Chicago, Ill

Address Peritonitis"

Dr Frederick A Collier Professor of Surgery, University of Michigan Medical School, Ann Arbor Michigan

Address Very Recent Advances in Medicine

Dr Russell M Wilder, Professor of Medicine, University of Minnesota Graduate School of Medicine Rochester Minn

Address Practical Points in Clinical Surgery

Dr W Wayne Babcock Professor of Surgery and Clinical Surgery Temple University School of Medicine, Philadelphia, Pa

Address Intravenous Anesthesia by Means of a New Thiobarbiturate, Pentothal Sodium"

Dr John S Lundy Professor of Anesthesia and Surgery, University of Minnesota Graduate School of Medicine Mayo Clinic Rochester, Minn

TUESDAY, OCTOBER 13

8 00 a m

Diagnostic Clinic Clinical Nutritional Disease (Vitamin B Deficiency)"

Dr Andrew Almon Fletcher University of Toronto Faculty of Medicine Toronto, Canada

Diagnostic Clinic Diagnosis and Treatment of Brain Tumors

Dr Walter E Dandy, Adjunct Professor of Neurological Surgery Johns Hopkins University School of Medicine Baltimore Md

Diagnostic Clinic Relation between Neurology and Psychiatry

Dr Bernard Sachs, Professor of Clinical Neurology Columbia University College of Physicians and Surgeons New York, N Y

Intermission for Review of Exhibits

Diagnostic Clinic Tumors of the Breast"

Dr John F Erdmann Attending Surgeon of the New York Postgraduate Hospital and Medical School New York N Y

Diagnostic Clinic The Psychobiology of the Peptic Ulcer Patient

Dr George Draper Associate Professor of Clinical Medicine Columbia University College of Physicians and Surgeons, New York, N Y

Noon Intermission

1 00 p m

Diagnostic Clinic Treatment and Guidance of Patients with Damaged Hearts'

Dr David Riesman Professor of Clinical Medicine and Professor of History of Medicine University of Pennsylvania School of Medicine Philadelphia, Pa

Address The Treatment of Endocervicitis

Dr Walter T Dannreuther Professor of Clinical Gynecology, New York Postgraduate Medical School New York, N Y

Intermission for Review of Exhibits

Diagnostic Clinic "Operative and Nonoperative Treatment of the Prostatic Obstruction"

Dr William E. Lower, Cleveland Clinic, Cleveland, Ohio

Diagnostic Clinic 'The Diagnosis of Bone Lesions'

Dr Dean D Lewis Professor of Surgery Johns Hopkins University School of Medicine Baltimore Md

Noon Intermission

1 00 p m

Address 'The Differential Diagnosis of Chills and Fever'

Dr James H Means Jackson Professor of Clinical Medicine Harvard University Medical School, Boston Mass

Address 'Diabetes Insipidus'

Dr Elliott C Cutler, Moseley Professor of Surgery Harvard University Medical School Boston Mass

Address 'Treatment of the Elderly Chronic Cardia'

Dr Cary Eggleston, Assistant Professor of Clinical Medicine Cornell University Medical College New York N Y

Intermission for Review of Exhibits

Address (Subject to be supplied)

Dr William J Mayo Mayo Clinic Rochester Minnesota

Address 'The Applied Physiology of the Sphincter of Oddi'

Dr Andrew C Ivy Davis Professor of Physiology and Professor of Pharmacology, Northwestern University Medical School Chicago Ill

Address The Acute Abdomen.

Dr Irvin Abell Clinical Professor of Surgery University of Louisville School of Medicine Louisville Ky

Address (Subject to be supplied)

Dr Joseph F McCarthy Professor of Clinical Urology New York Postgraduate Medical School New York, N Y

SOCIETY MEETINGS,  
CONGRESSES AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK  
BEGINNING MONDAY SEPTEMBER 21 1935

Saturday September 26—

\*10 a m. - 12 m Staff Rounds at the Peter Bent Brigham Hospital Conducted by Dr Henry A. Christian

\*Open to the medical profession.

September 22, 23 24—Twelfth Clinical Congress of the Connecticut State Medical Society See page 217 Issue of July 30 and page 564 of this Issue

October 4 17—Medico-Military Inactive Duty Training Mayo Foundation See page 512 Issue of September 10

October 5 and 8—The Edward K. Dunham Lectureship Harvard Medical School Amphitheater Building C at 3 p m See page 565

October 8—Pentucket Association of Physicians Hotel Bartlett 95 Main Street Haverhill at 8 30 p m

October 12 16—Twenty-First International Assembly of the Inter-State Post-Graduate Medical Association See pages 565 and 566

October 12 18—Third International Congress on Malaria. See page 1076 Issue of May 21

October 19 23—Clinical Congress of the American College of Surgeons See page 180 Issue of January 23

October 19 31—1936 Graduate Fortnight of the New York Academy of Medicine See page 1221 Issue of June 11

October 20 22—Academy of Physical Medicine Annual Meeting Hotel Statler Boston

October 20 23—The American Public Health Association See page 1226 Issue of June 11

November 16—One hundredth anniversary of the founding of the Army Medical Library 7th Street and Independence Avenue S W Washington D C

December 3 5—Annual Conference of the National Society for the Prevention of Blindness Columbus Ohio

March 30 April 2, 1937—First International Conference on Fever Therapy Postponement notice See page 52 Issue of July 2

April 21 24 1937—American Society for Experimental Pathology See page 1075 Issue of May 21

DISTRICT MEDICAL SOCIETIES

FRANKLIN DISTRICT MEDICAL SOCIETY

Will meet at the Weldon in Greenfield at 11 a. m the second Tuesdays of November January March and May

CHARLES MOLINE M.D Secretary

Sunderland

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

October 7—Bear Hill Golf Club Stoneham

November 18—Bear Hill Golf Club Stoneham

January 13, 1937—Bear Hill Golf Club Stoneham

March 16, 1937—Danvers State Hospital Danvers

May 11, 1937—Bear Hill Golf Club Stoneham

KENNETH L MACLACHLAN M.D Secretary  
14 Bellevue Avenue Melrose

PLYMOUTH DISTRICT MEDICAL SOCIETY

October 15—11 a m at the Moore Hospital Brockton

FRED F WEINER M.D Secretary  
231 Main Street Brockton

WORCESTER DISTRICT MEDICAL SOCIETY

September 23—At the Milford Hospital Milford Mass 4 30 p m Visitation of the Milford Hospital unit, which has been recently refurnished and added to 6 15 p m Dinner—complimentary by the hospital 7 30 p m Scientific program and business session The speakers for this meeting will be Dr Richard Miller and Dr Cadis Phipps of Boston who will give a symposium on Peptic Ulcer with Dr Miller discussing the surgical aspects and Dr Phipps the medical aspects of this condition.

October 14—Rutland State Sanatorium Rutland Mass. 6 15 p m Dinner—complimentary by the State Hospital. 7 30 p m Business session and scientific program. Speakers and subjects to be announced in a later issue of the Journal.

November 5—At 4 30 in the rooms of the Worcester Medical Library Inc. at 34 Elm Street Worcester will be held the fall Censors meeting

November 11—Grafton State Hospital North Grafton Mass 6 15 p m Dinner—complimentary by the hospital. 7 30 p m Business session and scientific program

December 9—St. Vincent Hospital Worcester Mass 6 15 p m Dinner—complimentary by the hospital 7 30 p m Business session and scientific program

January 13 1937—Worcester City Hospital Worcester Mass 6 15 p m Dinner—complimentary by the hospital 7 30 p m Business session and scientific program

February 10 1937—Worcester State Hospital Worcester Mass 6 15 p m Dinner—complimentary by the hospital. 7 30 p m Business session and scientific program

March 10 1937—The Memorial Hospital Worcester Mass 8 15 p m Dinner—complimentary by the hospital. 7 30 p m Business session and scientific program

April 14, 1937—Worcester Hahnemann Hospital Worcester Mass 6 15 p m Dinner—complimentary by the hospital. 7 30 p m Business session and scientific program

May 6 1937—At 4 30 in the rooms of the Worcester Medical Library Inc. at 34 Elm Street, Worcester will be held the spring meeting of the Board of Censors

Wednesday Afternoon and Evening May 12, 1937—Annual Meeting Time and place for this meeting will be announced in an early spring issue of the Journal.

ERWIN C MILLER M.D Secretary  
27 Elm Street Worcester



## Addresses by

Rear Admiral P S Rossiter  
Surgeon General, United States Navy,  
Washington, D C  
Major General Charles R Reynolds,  
Surgeon General, United States Army,  
Washington, D C  
Other distinguished citizens of the world

THURSDAY, OCTOBER 15

8 00 a m

Diagnostic Clinic "The Relation of the Psychoses  
to Systemic Diseases"

Dr Earl D Bond, Professor of Psychiatry, Uni-  
versity of Pennsylvania School of Medicine  
Philadelphia, Pa

Diagnostic Clinic "Indications for Surgery and the  
Surgical Treatment of Peptic Ulcer"

Dr Frank H Lahey, Director of Surgery in the  
Lahey Clinic Surgeon of the New England Bap-  
tist Hospital and New England Deaconess Hos-  
pital, Boston, Mass

Diagnostic Clinic (Subject to be supplied)

Dr Leonard G Rowntree Philadelphia Institute  
for Medical Research, Philadelphia, Pa

Intermission for Review of Exhibits

Diagnostic Clinic "Cryptorchidism"

Dr Hugh Cahot, Professor of Surgery, University  
of Minnesota Graduate School of Medicine,  
Rochester, Minn

Diagnostic Clinic "The Relation of Lumbo-sacral  
Joint to Low Back Pain"

Dr Alan DeForest Smith, Clinical Professor of  
Orthopedic Surgery, Columbia University Col-  
lege of Physicians and Surgeons, New York,  
N Y

Noon Intermission

1 00 p m.

Address "Allergic Diseases"

Dr Robert A. Cooke, Assistant Professor of Clin-  
ical Medicine, Cornell University Medical Col-  
lege New York N Y

Address "Significance of Menorrhagia and Metror-  
rhagia."

Dr John R Fraser, Professor of Obstetrics and  
Gynecology McGill University Faculty of Medi-  
cine, Montreal, Canada

Address "Application of Cavity Grafting"

Mr Archibald H McIndoe MB, ChB (N Z),  
MSc (Path) MS, F.A.C.S, FRCS (Eng-  
land), Assistant Plastic Surgeon St. Andrew's  
Hospital, Assistant Surgeon, Plastic Unit,  
St James's Hospital, Consulting Plastic Sur-  
geon Royal North Staffordshire Infirmary,  
Chief Assistant Plastic Surgery, St Bartholo-  
mew's Hospital Senior Surgeon, Hospital for  
Tropical Diseases, London, England

Intermission for Review of Exhibits

Address "Function and Deformity in Fracture Re-  
sults"

Dr Eldridge L Eliason Professor of Clinical Sur-  
gery, University of Pennsylvania School of  
Medicine, Philadelphia, Pa

Address "The Early Diagnosis of Bronchogenic  
Carcinoma"

Dr Chevalier Jackson, Professor of Bronchoscopy  
and Esophagoscopy Temple University School  
of Medicine,

and

Dr Chevalier L Jackson, Professor of Clinical  
Bronchoscopy and Esophagoscopy, Temple Uni-  
versity School of Medicine, Philadelphia, Pa.

Address "Water Balance in Children"

Dr Samuel Z Levine, Acting Professor of Pediat-  
rics, Cornell University Medical College, New  
York, N Y

Address "The Surgery of Acute and Chronic Com-  
pression of the Heart."

Dr Claude S Beck, Associate Professor of Sur-  
gery, Western Reserve University School of  
Medicine, Cleveland, Ohio

Dinner Intermission

7 p m

Address "Ophthalmic Consultations in a General  
Hospital"

Dr Lawrence T Post, Professor of Ophthalmol-  
ogy Washington University School of Medicine,  
St. Louis, Mo

Address "General Therapeutic Methods for the Pro-  
tection of Patients in the Extremes of Life"

Dr Irving S Cutter, Dean and Associate Professor  
of Medicine Northwestern University Medical  
School Chicago, Ill

Address "Periodic Health Examinations"

Dr Reginald Fitz, Associate Professor of Medi-  
cine Harvard University Medical School, Boston,  
Mass

Address "The Surgical Anatomy of the Anal  
Canal"

Mr C Naunton Morgan, F.R.C.S., Senior Assistant  
Surgeon to St Marks Hospital for Diseases of  
the Rectum, Surgeon to the Hospital for Tropi-  
cal Diseases Casualty Surgeon to St Barthol-  
omew's Hospital, London, England

Address "The Diagnostic Significance of the Respir-  
atory Rate"

Dr Frederick J Kaltefleiter Clinical Professor of  
Medicine, Jefferson Medical College, Philadel-  
phia, Pa

FRIDAY OCTOBER 16

8 00 a. m

Diagnostic Clinic "The Differential Diagnosis of  
Pain in the Chest"

Dr John A Oille Assistant Professor of Medicine  
University of Toronto Faculty of Medicine To-  
ronto, Canada

Diagnostic Clinic "Fracture of the Neck of the  
Femur The Problem Fracture"

Dr John J Moorhead Professor of Clinical Sur-  
gery, New York Postgraduate Medical School,  
New York N Y

Diagnostic Clinic "Protamine Insulin"

Dr Elliott P Joslin, Clinical Professor of Medi-  
cine, Harvard University Medical School,  
and

Dr Priscilla White Boston, Mass

# The New England Journal of Medicine

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NUMBER 15

## THE EFFICACY OF MEDICAL TREATMENT IN ESSENTIAL HYPERTENSION\*

BY ROBERT STERLING PALMER M.D.

**S**INCE interest in the surgical treatment of essential hypertension is becoming general and since the various surgical procedures are still experimental it behooves those who take the responsibility of advising patients to have clearly in mind the natural course of the disease and the effectiveness of medical management. Inasmuch as a large proportion of the adult population has at one time or another an abnormally elevated blood pressure, material is plentiful for drawing conclusions.

First one excludes more or less obvious causes of elevated arterial blood pressure, such as primary glomerulonephritis, cortical or medullary (pheochrom) adrenal tumors and urinary obstruction (prostate also in occasional cases unilateral obstruction as in silent hydronephrosis). There still remains wide variation from case to case of essential hypertension which requires classification to foretell accurately not only length of life but effectiveness of treatment.

These cases may be classified first according to intensity or rapidity of progress. The typical case of malignant hypertension in a young adult is extremely intense, advancing rapidly over weeks or months almost always less than two years from onset to fatal termination, while an average case aged 55 or over commonly lasts ten, often fifteen and occasionally over twenty years. Secondly patients may be classified according to degree and kind of vascular damage and degree and persistence of arterial hypertension. In general the higher and more persistently elevated the blood pressure the more advanced the disease. The intense rapidly progressive case shows vascular damage resulting from vasospasm, the kidney and brain including the retina exhibit the chief effects. The heart itself is little affected. In the more slowly progressive less intense case general vascular sclerosis develops and is seemingly almost protective. The heart is damaged more commonly the brain and kidneys relatively less so. Finally patients may be classified according to age. Young adults commonly show

vasomotor instability with transient rise in blood pressure which is harmless and not true essential hypertension. On the other hand at younger ages malignant hypertension is more likely to occur; it rarely appears in individuals over 55 years of age. At older ages the average benign long-continued type of case is common. Also frequently encountered are the elderly patients with large vessel sclerosis, showing a wide pulse pressure with a normal, or nearly normal, diastolic pressure and altered life expectancy comparatively little.

The 169 patients on whom the present report is based are divided according to age as follows: up to 36 years, 36 to 45 years and over 45 years. Each age group is further divided according to degree and persistence of arterial hypertension and degree and kind of vascular damage designated mild, moderate or severe. The intense rapidly progressive malignant cases among the latter are mentioned especially. In those patients sufficiently well followed for various periods during the last six years many of them for longer periods the trend of the blood pressure is noted. The presence or absence of symptoms and if available the effect of treatment on symptoms are given. The material may be taken as a control for the results of surgery and may assist those contemplating surgery in cases of essential hypertension in selecting their cases.

The majority of patients under 36 years of age in this series showed systolic blood pressures between 140 and 160 millimeters of mercury, some with pressures up to 180 millimeters were free from organic vascular change. The blood pressure was characteristically variable, often falling to normal spontaneously or, for the most part easily controlled by sedatives, increased rest and reassurance (table 1). Most of these patients have vasomotor instability, not true essential hypertension. Over 75 per cent of them will have normal blood pressures after ten years.<sup>1</sup> (This is true for males and the majority of the mild cases under 36 years of age in this series are drawn from periodic health examinations of predominately male groups.) A moderate degree of essential hypertension (systolic blood pressures 180 to 230 millimeters variable but not, as a rule,

From the Medical Clinic of the Massachusetts General Hospital.

\*Palmer Robert Sterling—Assistant in Medicine, Massachusetts General Hospital. For record and address of author see This Week's Issue, page 591.

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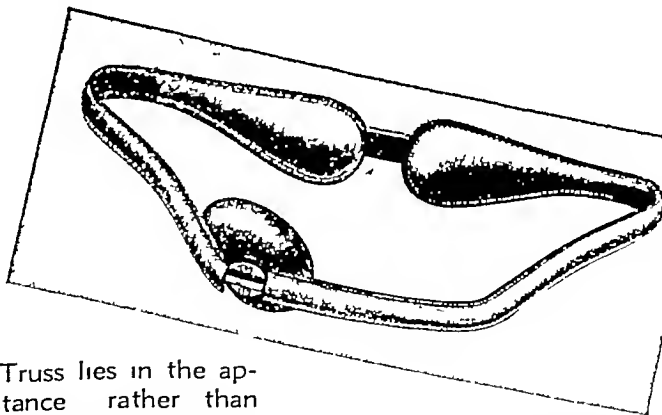
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apparent cure being effected or occurring spontaneously. The medical regimen it may be said involves time consuming detailed patient study of the individual with particular attention to his or her sources of nervous strain, the free use of phenobarbital, occasional hospitalization with heavy sedation and ample rest, sometimes as much as half of the time. Jacobson's so-called "progressive relaxation" is of great help.<sup>2</sup> Finally one should employ psychotherapy, advice, persuasion and suggestion. The latter is particularly important, since suggestibility may be made a great therapeutic ally although extreme caution in examination and explanation must be exercised to prevent it from becoming the opposite. In this group exercise is, as a rule, not limited, frequently

little over half have no symptoms or are symptomatically improved. Though twenty of the thirty-five patients in the severe group over 45 years of age have died it must be remembered the fatal outcome overtakes them at last. The average duration of the disease was 5.6 years in seventy patients of this type, previously reported.<sup>3</sup> Many live ten years or over and a few over twenty years having enjoyed years of active comfortable life. The rapid intense form of the disease is infrequent. There were only one definite and two questionable cases of malignant hypertension in this group.

## DISCUSSION

Reviewing this material as a whole (table 2) one may draw certain conclusions in regard to

TABLE 2

Classification	Blood Pressure				No of Cases	Symptoms			
	Fall	Average Fall— mm of Hg	Rise	Un changed		None	Better	Worse	Un changed
All ages combined									
Mild	33	30	3	17	53	25	22	0	6
Moderate	31	40	14	15	60	6	39	2	13
Severe	19	50	9	28	56	3	23	11	19
					169				

it must be prescribed in gradually increasing amounts. Digitalis is given only for impending loss of cardiac reserve. Fluid is limited and sometimes an acid diuretic is employed for the sluggish sedentary patient complaining chiefly of headache or a vague fullness in the head.

One group found toward the upper extreme of life commonly asymptomatic requiring no treatment and probably not representing true essential hypertension includes those with a systolic hypertension alone the diastolic pressure being at or near normal. The pulse pressure is wide and the signs of aortic regurgitation and thyrotoxicosis are absent. The basis is evidently large vessel sclerosis. It appears to be very well borne and seemingly does not significantly alter life expectancy.

In the severe group aged over 45 years we find the effects of the disease after eight or ten years and in many cases after fifteen or twenty years.<sup>3</sup> The medical problem is congestive or anginal failure or cerebral circulatory insufficiency. Rest, digitalis, diuretics and the so-called coronary dilators are indicated for the former, limited fluids, sedatives, alcohol and exercise for the latter. As indicated in table 1 less than half show a substantial fall in blood pressure and even then the systolic level often is 200 millimeters or over. In about 50 per cent the blood pressure level is unaffected. A

the efficacy of medical treatment. Under 36 years of age variable hypertension of mild degree represents vasomotor instability and requires no treatment or is readily controlled by simple measures. Late in life systolic hypertension with normal or near normal diastolic pressure, related to large vessel sclerosis is not important and usually does not require treatment. Considering the mild cases at all ages there is a substantial fall in blood pressure in better than 50 per cent. Almost 90 per cent either have no symptoms or are easily relieved.

Taking the cases at all ages graded moderate, there is a 50 per cent chance that a substantial fall in blood pressure will be obtained. Seventy-five per cent either have no symptoms or can be very much relieved. In the patients with a moderate degree of essential hypertension under 46 years of age one must consider most seriously the possibility of some radical therapeutic procedure (splanchnic resection) since up to this age malignant hypertension occurs more commonly. There is some evidence<sup>3</sup> that females may be more susceptible particularly if there has been abnormality of periods, toxemia or hypertension during pregnancy in the past. It is very impressive to see a young woman in her early thirties rapidly advance from an apparently variable mild vasomotor instability with only functional nervous symptoms to the malignant phase and death by

falling to normal, organic change of slight degree and slowly progressive) in individuals under 36 years of age is, in my experience, rare. When true essential hypertension occurs, too often it is the intense, rapidly progressive, malignant sort. Of the nine cases classified as severe (systolic pressure persistently over 230 millimeters, marked organic change), only two were

six mild cases have done very well. Again vasomotor instability may be the diagnosis. Simple medical measures generally are effective. The nine moderate cases in three instances showed a favorable blood pressure response to treatment, six were symptomatically improved. Five of the nine showed a tendency to progression of the disease in spite of treatment. The

TABLE 1

Classification	Blood Pressure				No of Cases	Symptoms			
	Fall	Average Fall— mm of Hg	Rise	Un changed		None	Better	Worse	Un changed
Under 36									
Mild	11	27	0	12	23	13	7	0	3
Moderate	2	25	2	1	5	0	4	0	1
Severe	4	51	1	4	9	0	4	4	1
36 to 45 inclusive									
Mild	4	31	0	2	6	4	2	0	0
Moderate	3	50	5	1	9	0	6	0	3
Severe	2	40	4	7	13	0	4	4	5
Over 45									
Mild	18	30	3	3	24	8	13	0	3
Moderate	26	40	7	13	46	6	29	2	9
Severe	13	51	4	17	34	3	15	3	13

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the slowly progressive, sclerosing sort which develop cardiac hypertrophy and show very little renal change. One of these lasted ten years and died of cerebral hemorrhage in his early thirties. The other after a year and a half, is comparatively free from symptoms, the blood pressure has fallen 65 millimeters to 190. Six of the remaining seven were diagnosed malignant hypertension. One was diagnosed probable malignant hypertension. Five of the seven were females. One is untraced, four have died, one other almost certainly has died. The one living case had a silent hydronephrotic kidney removed with a marked lowering of blood pressure to date, several months after operation, and with considerable symptomatic relief. Apart from this case the picture is dark. Under medical treatment one may obtain a fall in blood pressure of 50 millimeters, but it is of little help if the pressure is still well over 200. Lumbar puncture, venesection, heavy sedation, magnesium sulphate by mouth or intramuscularly and x-ray therapy to the pituitary separately or in combination, have given symptomatic relief. The excruciating headaches are greatly relieved. Edema of the optic nerve has been definitely reduced in one case by venesection and spinal drainage. Nevertheless the truth remains that steady, rapid progress in most cases to uremia and death, in others to heart failure or cerebral accident, has not been stayed by medical treatment.

In the 36 to 45, inclusive group, four of the

problem under the age of 46 years is to exclude vasomotor instability and, if possible, to recognize those patients who may be entering the malignant phase. Of the thirteen cases graded severe only two showed a significant sustained fall in blood pressure for over a year. In one of these it eventually rose again. Four showed a rise, seven stayed the same. Results symptomatically were about equally divided between better, worse and unchanged. Nine of the thirteen have died, four of them were in the malignant phase. Of the four malignant cases three were females.

In the third group, aged over 45 years were the familiar, typical, average cases of essential hypertension. Many were associated with the menopause. Females outnumbered males about two to one. Of the twenty-four mild cases eighteen showed a substantial reduction of blood pressure, three remained at the same more or less innocuous level, only three grew worse. A third were asymptomatic. Fifty per cent were symptomatically relieved. Over half of those graded as moderate showed a substantial reduction in blood pressure. One third remained the same. Fifteen per cent showed a tendency for the blood pressure to become higher. Almost two thirds were symptomatically relieved. An additional thirteen per cent had no symptoms.

In general the mild and moderate cases at middle life and beyond are very satisfactorily controlled by medical treatment, occasionally an

Burning or pain relation to urination degree (slight moderate severe occasional), anterior perineal suprapubic following liquor only and so forth

Dysuria is rather vague and is best avoided

Dribbling needs further description as to whether a few drops in clothing after voiding or a small stream with so little force that it drops straight down from the meatus

Hematuria any recent initial massive (in all urines) or terminal bleeding Sand or gravel, recently passed, removed or found by x-ray

#### PAST HISTORY

Number of attacks of gonorrheal urethritis, last attack when, when was last massage sound or instillation (e.g., the patient may have used an instillation today) Note complications with any previous gonorrhea, especially small caliber stricture, or any urethritis of long duration

Record previous genito-urinary operations, x-rays of the urinary tract cystoscopy or urethroscopy, when and why done and what was found If previous calculi, pyelitis, or operation on prostate ureter, or kidney, pathology connected therewith must always be suspected, even when the second urine is clear

#### SEXUAL HISTORY

Symptoms connected with sexual function must not be neglected and their duration, frequency, and severity should be noted, together with their relation to erections, intercourse and continence Patients complaining of bloody ejaculations may be allowed infrequent coitus after a period of abstinence from all sexual stimulation and then the fresh condom specimen should be examined for gross and microscopic blood Vesiculitis or chronic posterior urethritis (verumontanitis) is often the cause of such a symptom, the latter frequently due to prostatitis or vesiculitis

Questions as to masturbation and various "abnormal" sex practices may occasionally have a place in the history of males presenting urethral discharge If such points are not raised until several visits have been made a more truthful story may be obtained

Prolonged sexual excitement (especially if unrelieved by coitus), as well as excessive intercourse, must be considered as factors in urethral discharge and in vesiculitis and prostatitis

#### DIFFERENTIAL DIAGNOSIS

With gonorrhea excluded but discharge still present it is a great temptation either to do

too much to the patient or to go to the other extreme of half-hearted treatment There is a safe middle ground that will vary considerably in different cases which will give all of the symptoms adequate attention without subjecting any to unnecessary procedures

*Prostate and Vesicles* The prostate is usually investigated first In the absence of any untoward symptoms such as dysuria or frequency this may be lightly massaged if the second urine is clear No great effort should be made to obtain prostatic fluid at this visit At later visits more and more pressure may be used at the massage as we learn how much the patient will tolerate, but this should not be repeated oftener than every three days Five to seven day intervals are often better at first Two or three examinations of prostatic fluid may be necessary to determine the presence or absence of prostatitis At each massage catch some of the prostatic fluid on a slide and press the cover slip down so as to form a thin layer Look for the amount of pus (noting any clumping of white blood cells), red blood cells lecithin, and sperms White blood cells or other elements may be recorded as occasional, 5 per cent, 10 per cent 50 per cent, and so forth According to one system of evaluating prostatic fluid the percentage of leucocytes is balanced against the other formed elements present, especially lecithin so that only a few white blood cells with no lecithin would be called pus 100 per cent whereas the presence of the same amount of pus with 80 per cent of the (normal constituent) lecithin might be considered a mild prostatitis There is much clinical evidence to support this view Prostatic fluid may be stained in the search for gonococci or other bacteria or in case there is any question as to the actual amount of pus or other elements where the unstained prostatic fluid gives doubtful findings

Possible vesiculitis must be considered always A prostatitis may or may not be accompanied by vesiculitis and no doubt there may be vesiculitis without prostatitis In any event enough patients get well after stripping the vesicles, when other treatments fail to make this procedure worthwhile Until vesiculitis is ruled out, at each prostatic massage gently stroke the vesicle area and watch for thick stringy secretion which may be caught on a slide and put under the microscope The vesicle substance is readily identified as it is too thick to mix with any prostatic fluid that may be on the slide, and it is usually easy to determine whether any white blood cells are a part of the vesicle secretion or there merely because they are in the prostatic fluid Often the material obtained from the diseased vesicles will be semisolid and it may show no white

uremia within three years. If careful observation suggests the intense course of the disease, this may be the best indication for surgery.

Of the severe group over 45 years old many have reached the late stage after a long course. A substantial fall in blood pressure is obtained in one third. There are no symptoms or satisfactory symptomatic relief obtained for considerable periods in 46 per cent. The vascular changes are marked and irreversible. Any real amelioration by surgical intervention is inconceivable.

The severe cases at the younger ages most frequently are malignant. Medical treatment can offer nothing to stay the rapid progress and can give only brief and partial symptomatic relief. Any possible help from surgery, either in halting progress or in real symptomatic relief, will be most welcome.

#### CONCLUSIONS

Careful and thorough medical treatment of essential hypertension results in a substantial fall in the systolic blood pressure in half of the mild and moderate cases and one third of the severe cases. Symptomatic relief is obtained in 90 per cent of the mild cases, 75 per cent of the moderate cases and 46 per cent of the severe cases.

Surgical treatment of essential hypertension must be evaluated according to its effectiveness in the various types and degrees of severity of the disease and the sole criterion should be its effect on the blood pressure without the aid of medical treatment. The most pressing question is whether the ultimate late effects of continued arterial hypertension can be prevented. A reasonable answer to this question cannot be given in less than five years.

Surgery may be indicated in certain patients in the mild or moderate group, especially in young adults who show evidence of rapid progress with a tendency for the disease to develop into its most severe (malignant) form.

Any help from surgical treatment in malignant hypertension giving reasonably sustained symptomatic improvement but especially, staying the rapid progress of the disease will be most welcome.

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1. Palmer R. S. The significance of essential hypertension in young male adults. *J. A. M. A.* 94:94 (March 8) 1930.
2. Jacobson E. *Progressive relaxation*. Chicago University Press, 1935. You Must Relax. New York and London Whittles House 1934.
3. Palmer R. S. and Thorp E. G. Clinical considerations in regard to etiology, characteristics and prognosis of essential hypertension at different ages. *New Eng. J. Med.* 214 1019 (May 21) 1936.

## NONSPECIFIC URETHRITIS ITS CAUSES, DIFFERENTIAL DIAGNOSIS, EXAMINATION ROUTINE AND TREATMENT\*

BY NORMAN D. SHAW, M.D.,† AND WALTER M. BRUNET, M.D.†

**N**ONSPECIFIC or primary inflammation of the urethra is not uncommon in the male. Urethritis due to systemic disease, chemical irritants, alcohol, sexual excesses, instrumentation or other causes is found in 5 to 10 per cent of the patients consulting the urologist or clinic. The predominance of the gonococcus as the etiologic factor in most men with urethral discharge obviously associates the term urethritis with gonorrhea. Those who have a discharge, not due to gonorrhea, demand at times more of our attention and they do require different management. An effort is made here to correlate commonly accepted methods of diagnosing and treating urologic patients in a simple scheme adapted to fit nearly all patients presenting this symptom. Let us start with the history.

#### PRESENT ILLNESS

The genitourinary history is a most important guide to treatment and in the choice of

From the Urological Division of the Public Health Institute, Chicago, Illinois.

†Shaw, Norman D.—Staff Member of the Public Health Institute. Brunet, Walter M.—Chief of Staff and Director of Urological Division, Public Health Institute. For records and addresses of authors see "This Week's Issue" page 591.

diagnostic procedures. This should be brief and tabulated so that it may be read at a glance, somewhat as follows:

**Discharge:** duration, character (thick, mucoid and so forth), amount (profuse, a drop on squeezing, and so forth), recent changes or exacerbation present only following coitus, liquor straining or at the end of urination.

**Frequency:** (day) Record average number of times daily and duration of complaint, if there is abnormal frequency. Desire to void often may be present without actual frequency.

**Nocturia:** length of time present, whether getting worse, due to evening fluids (?)

**Urgency:** how long constant (?), getting worse (?), and so forth.

**Incontinence:** how long, day or night, and so forth.

**Change in stream:** such as hard to start, small, interrupted, how long, present only when bladder is full or after liquor (?), and so forth. Recent acute retention, number of times it was necessary to use a catheter, difficulty in passing same (?).



Burning or pain relation to urination degree (slight moderate, severe occasional), anterior perineal, suprapubic following liquor only, and so forth

Dysuria is rather vague and is best avoided

Dribbling needs further description as to whether a few drops in clothing after voiding or a small stream with so little force that it drops straight down from the meatus

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#### PAST HISTORY

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too much to the patient or to go to the other extreme of half-hearted treatment There is a safe middle ground that will vary considerably in different cases which will give all of the symptoms adequate attention without subjecting any to unnecessary procedures

*Prostatic and Vesicles* The prostate is usually investigated first In the absence of any untoward symptoms such as dysuria or frequency this may be lightly massaged if the second urine is clear No great effort should be made to obtain prostatic fluid at this visit At later visits more and more pressure may be used at the massage as we learn how much the patient will tolerate, but this should not be repeated oftener than every three days Five to seven day intervals are often better at first Two or three examinations of prostatic fluid may be necessary to determine the presence or absence of prostatitis At each massage catch some of the prostatic fluid on a slide and press the cover slip down so as to form a thin layer Look for the amount of pus (noting any clumping of white blood cells), red blood cells leucithin, and sperms White blood cells or other elements may be recorded as occasional, 5 per cent, 10 per cent 50 per cent, and so forth According to one system of evaluating prostatic fluid the percentage of leucocytes is balanced against the other formed elements present especially leucithin so that only a few white blood cells with no leucithin would be called pus 100 per cent whereas the presence of the same amount of pus with 80 per cent of the (normal constituent) leucithin might be considered a mild prostatitis There is much clinical evidence to support this view Prostatic fluid may be stained in the search for gonococci or other bacteria or in case there is any question as to the actual amount of pus or other elements where the unstained prostatic fluid gives doubtful findings

Possible vesiculitis must be considered always A prostatitis may or may not be accompanied by vesiculitis and no doubt there may be vesiculitis without prostatitis In any event enough patients get well after stripping the vesicles, when other treatments fail to make this procedure worthwhile Until vesiculitis is ruled out, at each prostatic massage gently stroke the vesicle area and watch for thick stringy secretion which may be caught on a slide and put under the microscope The vesicle substance is readily identified as it is too thick to mix with any prostatic fluid that may be on the slide, and it is usually easy to determine whether any white blood cells are a part of the vesicle secretion or there merely because they are in the prostatic fluid Often the material obtained from the diseased vesicles will be semisolid and it may show no white

blood cells. If some urine is retained in the bladder so that the patient can void in a glass after treatment, a surprising amount of obviously abnormal vesicular material may be seen. Remember that the vesicle area (as well as the prostate) may be quite sensitive in the normal individual, that just because a vesicle is palpable does not mean that it is diseased, and that vesiculitis may be present (as shown by the character of the secretion and the results of treatment) without the vesicles ever being palpable or tender. Hot rectal douches and sexual rest for a time are valuable parts of the treatment in vesiculitis.

**Stricture.** Any encroachment on the urinary canal may be a cause of discharge whether it be stricture, small meatus or some pathology about the bladder neck (e.g., such as might cause residual urine). The problem as to how many strictures, or what type, are a cause of symptoms is open to question, each case being decided on its merits. Given a discharging urethra with stricture, the stricture should be treated, at least for a time. If any doubt is present as to the importance of a given stricture as a cause of discharge we may assume that, if there is a considerable relative disproportion between the size of the stricture and the caliber of the urethra, treatment is indicated, whereas the benefit derived from treating a large caliber stricture may be nil.

The meatus and the anterior urethra are catheterized with olive bougies. From this point on Van Buren sounds are generally used. With a negative past genito-urinary history it may be well to keep out of the posterior urethra if possible. In the middle aged or older men the Van Buren may well be omitted, a catheter being large enough to check for possible stricture of the deep urethra. It has the added advantage also of revealing any residual urine. The finding of over an ounce of residual urine at several visits may be an indication for rather complete study (intravesical hypertrophy of prostate and bladder neck changes).

**Meatotomy.** No hard and fast rule may be given but a small meatus is similar to stricture and must be so considered in the treatment of a discharge. It is conservative to say that any meatus that will not take a No. 20 sound may be considered an important factor in perpetuating discharge even though the urethra is small, but if the urethra seems to be much larger than the meatus a meatotomy may be imperative. Even a meatus as large as 24 (with a considerably larger urethra) may be open to suspicion. Naturally, meatotomy also is indicated in treating those patients who require sounds larger than the meatus. The posterior meatus of the fossa navicularis often

must be cut also. Neither this nor the meatus proper can be dilated by sounds.

**Uroscopy.** No doubt inspection of the urine for purposes of diagnosis even antedated the manufacture of a crystal vessel which would permit it to be viewed by transmitted light. But nowadays many of the profession leave all urine tests (inspection included) for the laboratory. This is not adequate in urologic practice, either with male or female patients. Having the patient void in two or more glasses may give us information that is as important as any chemical or microscopic test—occasionally more so. While various numbers of glasses may be used, a good knowledge of the fundamentals of the two glass test usually suffices. Changes in the appearance of the first urine are usually due to washings from the urethra, while gross abnormality in the second glass often comes from pathology above the prostate. Rarely the terminal urine may be hazy from prostatitis or an acute posterior urethritis with profuse discharge, which drains back into the bladder so that all urines are turbid. Chronic posterior urethritis may be expected to have no effect on the second urine beyond shreds, at the most. Generally a dirty first urine with a clear second points to anterior urethritis only.

Patients whose second urine is not clear are in a class by themselves even though discharge is the only complaint. Generally speaking with them we defer massage and instrumentation longer. However, eventually the case with a turbid second urine without acute symptoms will be given the same study and treatment as the one with a clear second urine. The chronically infected lower urinary tract generally tolerates insult very well, though the passage of an instrument through the posterior urethra may be deferred until other treatment has been tried. In a patient with a history of gonorrheal urethritis, stricture of the posterior urethra always must be ruled out. A catheter or soft bougie may be used for this instead of a sound, the catheter having the advantage of detecting residual urine (as mentioned above) and permitting a posterior instillation at the same time. Any posterior urethra that will take a No. 12 catheter may be considered adequate, at least during the first few trial treatments. The conservative management of these patients frequently results in a clear urine and a favorable prognosis that might not be possible had they been subjected to vigorous treatment and thorough instrumental study at the outset with aggravation or spread of the original trouble.

#### TREATMENT

After a reasonable time, say two weeks after the last exposure and/or one week after the first appearance of the discharge, local treatments

may be begun. During the first visits a plan of treatment at one two or three day intervals is usually instituted depending on the symptoms present. Suitable urinary antiseptics or sedatives may be prescribed along with a regime such as followed during an early gonorrheal urethritis. Gradually during this period all necessary diagnostic procedures are carried out with no particular distress to the patient and with no risk of making a bad matter worse by too vigorous treatment. Acriflavine 1-4000 may be given at the beginning as an antiseptic instillation. If the discharge persists irrigations of potassium permanganate 1:10000 or weaker may be used either in the anterior urethra or in the anterior and posterior urethra. None of the latter should be allowed to remain in the bladder, so if residual urine is found, the solution must be drained away with a catheter. Instillations of protargol 1/2 per cent are often satisfactory following prostatic massage or the passage of sounds.

#### OFFICE RECORDS AND PROGRESS NOTES

A detailed record of the condition of the external genitalia is made at the first examination. At each visit inspect the meatus for discharge gently stripping the urethra if none presents spontaneously, note the appearance of the first and second urines if the prostate is to be massaged some urine should be retained so that the patient may void immediately after, next in order come sounds or a catheter to check up on the amount and appearance of any residual, and last any instillation or irrigation. Make a brief record of each treatment with complaints, progress notes and any prescription given. It is a good practice to study all urethral smears by staining them with methylene blue while the patient is present in order that a verbal report may be given.

#### GENERAL CONSIDERATIONS

The patient with a urethral discharge must be told to take no alcoholic beverages and usually sexual rest is ordered. A general physical examination is of value. Any foci of infection should be eradicated. Certain patients may prove refractory and require special management. In this group we have in mind cases of diabetes those with residual urine (especially if over one ounce or if any catheterized speci-

men shows pus or bacteria), and as above noted, those whose second urine is not clear. In the event that the second urine does not remain clear or if urinalysis shows evidence of infection, higher urinary tract study is indicated. If this cannot be done promptly, mild local treatment may be continued, but an x-ray of the genito-urinary tract should be obtained in the interim to exclude silent calculi and the urine may be examined for tubercle bacilli and other bacteria. We think it good medicine to advise every patient with a persistent discharge to have a cysto-urethrosopic examination, at the very least even if the urine remains normal. If the discharge does not yield to continence abstaining from alcohol hot Sitz baths and the indicated treatment approach the problem again as if it were the patient's first visit. Perhaps he has been accustomed to frequent coitus and this should be resumed again moderately and without prolonged or frequent sex excitation. Is there a mild prostatitis or vesiculitis that has been overlooked in spite of careful examination? Repeat prostatic smears. If there is any doubt as to the meatus being adequate do a meatotomy. Mild astringent home injections may be considered, rather late in the case if a little discharge persists.

#### SUMMARY

- 1 The male patient with a discharge may present the first sign of serious disease, and all possibilities must be kept in mind so that where a complete urinary tract study is necessary it may be given without delay.
- 2 First exclude gonorrheal urethritis and chemical urethritis by a short observation period during which local treatment is not given.
- 3 Then look for prostatitis vesiculitis stricture of the anterior urethra small meatus stricture in the membranous urethra obstruction at the bladder neck and higher urinary tract disease.
- 4 A diagnosis of nonspecific urethritis may be made only after the usual causes of discharge are excluded (such as stricture prostatitis, vesiculitis "pyuria").
- 5 If the second urine is not clear or if it continues to show pus red blood cells or bacteria, diagnostic procedures called for in the study of higher urinary tract disease are indicated.

## RUPTURED OVARIAN CYST IN CHILDHOOD

## Report of a Case

BY GEORGE C. KING, M.D.,\* AND CORNELIUS H. HAWES, M.D.\*

A REVIEW of recent literature shows that a ruptured ovarian cyst during childhood is an uncommon lesion. In 1931 Steel<sup>1</sup> estimated the occurrence of ovarian tumors of all types as 97 per cent in adults, 3 per cent in children. A few have occurred in very young children and in the stillborn. Doran<sup>2</sup> reported a case of bilateral ovarian cyst in a seven months' fetus. In Chiene's<sup>3</sup> case the patient was only three months old. In 1891 appeared Beale's<sup>4</sup> report of an ovarian cyst with fatal rupture in an infant six weeks old, this and Dodek's<sup>5</sup> case of ruptured ovarian cyst in a newborn infant furnish two rare examples of this condition in which the cyst was found ruptured at postmortem examination.

These cases, however, appear to be in a different category from those in which the patients are between ten and fourteen years of age. In the latter, complications of rupture or suppuration of the ovarian cyst are rarely found. Torsion of the pedicle, also of rare occurrence is reported to be the most common complication. We have, therefore, thought it worth while to report the following case of ruptured ovarian cyst which occurred in a girl of twelve years.

## CASE REPORT

CASE No 36155. E. P., aged 12, a student was admitted to the Truesdale Hospital March 2, 1936 complaining of severe pain in the right lower quadrant of two hours' duration. Three weeks previously while at school, she had had her first attack of sudden lower abdominal pain. It was so severe that the child could not walk and had to be carried home. She quickly recovered from this attack however, and was up and about the following day.

During the next three weeks the patient felt slight transitory grumbling pains in the right lower quadrant of the abdomen but did not feel called upon to mention them to her mother. She was not nauseated and did not vomit. The day prior to the second attack she felt well, danced in the evening and slept all night. The following morning about 7:30 she got out of bed as usual and began to dress for school. She was suddenly seized with an intense pain in the right lower quadrant which made her cry out and double up. She was unable to move and had to be carried to the bed. Dr. King was summoned immediately. Upon reaching the girl's home he found her very pale but the pain was beginning to diminish in severity.

The child's menstrual history was unusual. Her periods began one year previously at the age of eleven and were regular, lasting four days. The day before the onset of each period the child complained of pain but more recently it had been less severe. The last period was three weeks prior to entry.

Previous illnesses included measles, whooping cough, pneumonia at the age of two, tonsillitis and frequent attacks of bronchitis. A tonsillectomy was done in 1934.

The child's father died at 48 years of cancer of the stomach. The mother, aged 52, has heart trouble. Four sisters and two brothers are living and well. Two siblings died in infancy. There was no history of tuberculosis.

Physical examination upon entry showed a well developed and well nourished, very pale Portuguese girl of twelve years lying in bed crying. The temperature was 99° by mouth, pulse 140 and respirations 22. The skin and mucous membranes were extremely pale. The eyes and ears were normal. The teeth were in excellent condition, the tongue coated and the throat slightly injected. The lungs were clear and resonant. No rales were heard. The heart was of normal size with regular rhythm and no murmurs. The abdomen was soft and pliable with no masses or spasm. There was generalized tenderness below the umbilicus. The extremities were negative.

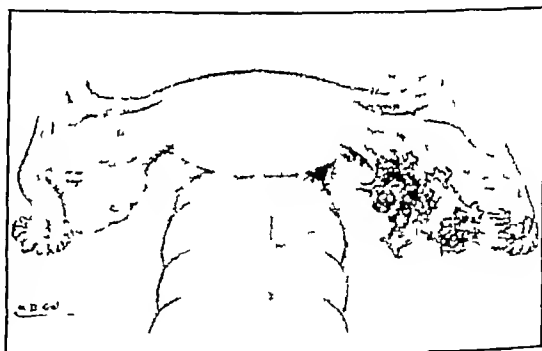


FIG. 1 (Right cystic ovary ruptured)

The following laboratory data were gathered directly after admission.

The urine showed an acid reaction, a trace of albumin and one or two pus cells per high power field in the sediment.

Examination of the blood revealed 3,630,000 erythrocytes, 11,700 leucocytes and 70 per cent hemoglobin. The smear and differential were normal.

The preoperative diagnosis was right ovarian cyst (probably ruptured).

About four hours after the onset of the attack the patient was taken to the operating room and under gas-oxygen-ether anesthesia the abdomen was opened through a right lower rectus muscle splitting incision. The abdominal cavity was full of bright red fluid which gushed forth as soon as the peritoneum was opened. The fluid unfortunately was not measured but the amount was estimated as about a pint. On the right were found the frayed edges of a cystic ovary which had ruptured, there apparently being no normal ovary left (fig. 1). There was moderate bleeding from the ovarian vessels where they entered the base. Since little ovarian tissue remained, the pedicle was clamped and the remains of the cyst and ovary removed. The pedicle was then tied with chromic catgut.

The pathologic report follows.

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The specimen consisted of a small mass of ovarian tissue and an appendix. The ovarian tissue was somewhat flattened, measured 2 by 3 cm and had frayed edges. The surface was hemorrhagic.

The appendix measured 7 cm in length with no injection of the serosa. When opened the lumen was patent and the wall somewhat thickened. The mucosa was smooth and pale.

Microscopic examination revealed considerable typical ovarian tissue which was somewhat edematous and infiltrated with blood. In the more compact tissue primitive ova were seen. There were graafian follicles in various stages of development. The lining of the cyst had been largely destroyed by hemorrhage but in a few places stratified cells were seen which were remnants of the lining.

The appendix was essentially normal.

Diagnosis: Follicular cyst of the ovary, ruptured.  
Normal appendix.

#### SUMMARY

Since ruptured ovarian cyst during childhood is an uncommon lesion, this case seemed worth recording. The preoperative diagnosis of right ovarian cyst was definitely indicated because of the history of sudden intense pain in the right lower quadrant of the abdomen, followed three weeks later by a second acute attack of a sim-

ilar nature. The quiescent interval with little disturbance and the absence of nausea or vomiting tended to rule out an attack of acute appendicitis. Moreover, just prior to operation the child was far more comfortable than would have been the case if she were suffering from appendicitis.

We were struck with the similarity of this clinical picture and that so often encountered in cases of ruptured ectopic pregnancy in the adult. When first seen at home the child was pale. Two hours later at the hospital an increase in pallor was noted, which together with the gradual subsidence of pain led the examiner to suspect hemorrhage from a ruptured ovarian cyst.

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## THE LEGAL ASPECTS OF INDUSTRIAL DERMATOSES

BY JOHN GODWIN DOWNING, M.D.

**WORKMEN'S** compensation laws of the United States had their inception in 1908 as a result of an act of Congress to compensate certain government employees. On July 1, 1912, the Massachusetts act went into effect and since then this act has been used as a model in many states. The act in Massachusetts has been of inestimable benefit to the industrialist of this state; it has shown the many pitfalls on the way to justice and the decisions of the Industrial Accident Board would make a very interesting and valuable contribution to legal medicine. Various methods have been tried and rejected. A so-called Arbitration Committee consisting of a representative of both parties and a member of the Board was found to delay the proceedings so that now the decision is made by a single member of the Industrial Accident Board, which consists of seven full-time members, one of whom must be a woman. They do not have to be lawyers but are expected to have an expert knowledge of industry, the workers' environment, hours and wages and the hazards to which they are exposed. They are aided in increasing their knowledge by six inspectors, who attempt to secure all available information in any case at the request of the members. The Board has a medical adviser who is an expert on industrial diseases. The case is heard by a single member from whom there is appeal to

the reviewing board, i.e., three to five members, appointed by the chairman through to the Superior and the Supreme Courts.

The act has been a tremendous blessing to the employee, but it still is far from being perfect. It does not provide for the rehabilitation of the disabled worker, except in some cases where the individual employer takes care of the disability and the compensation. In such an instance, provision is made to train the worker in another type of occupation. But in these days of efficiency experts, when a man has learned a highly specialized trade such as that of an engraver, and becomes disabled because of skin irritants, he is of no value to his employer or to others in any job involving contact with skin irritants. These men, insured by an insurance company or by a mutual association of a group of employers, are in rather a pathetic situation. The act does not insist that the injured secure proper and efficient treatment, so that there are always cases when there is an unnecessary delay in the return to work. Disability is prolonged and occasionally a neurotic permanent invalid is the result. After the acute disabling symptoms are relieved, light work away from contact with irritants should be found with insistence that the worker accept it. However, the trained artisan will frequently, and with some justice, decide that his disability, no matter how slight, has a certain redemption value. "Tree-trimmers" men who dress and clean shoes may demand a high price for

a dermatitis of one finger which does not disable them from ordinary work, but may eliminate them from their trade, and they are apt to prolong this dermatitis until they are given a lump sum settlement, with the result that the patient is not so much interested in his physician's effort to restore him to work as in his financial readjustment. Occasionally an insurance company attempts to deny a just claim in order to avoid medical fees, figuring that the claim can be settled cheaper by a lump sum; they are not interested in the complete rehabilitation of the worker in the lessening of the periods of incapacity, for the more disabilities the higher the premium. This statement, however, generally applies to smaller companies which prefer to eliminate these sporadic claims, for the larger companies are beginning to realize that the lump sum settlement is for them merely a temporary benefit, because each worker who wins a lump sum is an object of envy to his fellow workers, some of whom would be willing to suffer a dermatitis to gain what they figure might be equivalent to a life's saving.

Although the burden of proof that his dermatitis is the result of his work rests on the employee, it is apparent that many cases are decided in favor of the patient because there are thought to be irritants in his work and because he denies the possibility of any irritating contacts at home. In most cases, the proof of an industrial dermatitis is furnished by the insurer. If, however, attempts to establish an industrial contact fail, there is no way to insist that the worker help to eliminate non-industrial or environmental contacts. Where there are known irritants in an industry, it is almost impossible to deny a claim, but there is no reason why a worker should be compensated for a dermatitis contracted outside of his work, for all compensations depend on the causal relation of work. In employment of the noninflammatory type the employee with an eruption on the skin may date its inception to a surgical trauma dated weeks previously. Although the employee ought to be able to prove that it was the proximate result of an injury arising out of his employment, it may only be necessary for him to claim that previous to the alleged injury, for instance a bump on his lower leg where he now shows a varicose eczema, he was a healthy and an efficient worker. The cost of industrial insurance is increasing tremendously and it is a known fact that, as rates increase, business decreases. This is shown in the stone cutting industry in Massachusetts which has decreased from a three million dollar business to less than half a million dollar one in a few years. Industrial dermatoses can be prevented in many instances. The proposed study by the committee appointed by the Section of Dermatology of the American Medical

Association should be of tremendous value and an impetus to the inclusion of industrial dermatoses in the compensation laws of all of the United States.

The compensation laws of the various states are either the "scheduled form", designated, or the "blanket form", which takes care of every claim. The trend is toward the "blanket form", as is evidenced by the recent act amending the workmen's compensation law in relation to occupational diseases which took effect September 1, 1935, in New York State and the recent legislation in Rhode Island and Illinois, California, Connecticut, Massachusetts, North Dakota, Wisconsin, the District of Columbia, Hawaii and the Philippine Islands also compensate for all occupational diseases. Most insurance officials are in favor of this form. In Missouri compensation is optional with the employer. A number of states and territories have so called schedules of occupational diseases in connection with their workmen's compensation acts, in all but New Jersey the disease must have been contracted in connection with a given industrial process or processes. In Massachusetts an employee is entitled to compensation for impairment of earning capacity resulting from a personal injury arising out of, and in the course of, his employment. Personal injury means that there must be a lesion directly traceable to a happening in the employment and arising out of it.<sup>1</sup> A damage to a physical organ or a definite and specific detriment to the physiologic structure of the body is such an injury;<sup>2</sup> that the employee is unusually susceptible to the particular type of injury is not considered material.<sup>3</sup> When an employee contracts irritants in his work which cause a disabling skin eruption, he is entitled to compensation from the insurer of his employer. If he recovers, goes to work for a different employer and there contracts what causes another disabling skin disturbance, or a return of the same one, he is entitled to have the insurer of the latter employer compensate him. There were, however, three decrees of the Supreme Judicial Court of Massachusetts concerning cases in which the employees, after having received compensation from the insurers of their employers, went to work for other employers where they were subjected to irritants and became disabled again and where the Industrial Accident Board had held the original insurers liable for the compensation. The Supreme Judicial Court reversed these decisions and said that in each case there was no evidence that the subsequent attacks of dermatitis were due to the original exposure and not to the later contact with irritants, the latter being an independent intervening cause which broke the chain of causation between what happened originally and the disability in question.<sup>4, 5, 6</sup> A fourth case contained evidence of

a conflicting nature upon practically every point again the Board held the original insurer liable. This time the Court sustained the Board and decided that the evidence warranted a finding that the original dermatitis never cleared up and that since there was no evidence to show that the further exposures affected the original condition the rule laid in the previous cases was not applicable.<sup>6</sup>

The employee who by reason of his occupation has developed a sensitivity to certain irritants which make him unfit to continue his trade although his physical condition is not such as to disable him physically, presents an interesting problem. In one case<sup>7</sup> the claimant had been disabled by a dermatitis from September 1932 until April 12 1933 when he returned to his occupation. On June 14 1933 he was told that he could work no longer on account of his sensitivity. He then was awarded total disability by the Industrial Accident Board. The Court decided that although the original eruption had disappeared the employee's skin had never returned to normal, testimony in the record was sufficient to justify a finding of 'disability as to the particular employment but not as to employment in general. It was the duty of the employee to try to get other work.'<sup>8</sup>

In Massachusetts and other states, compensation is awarded for latent syphilis activated by trauma.<sup>9</sup> Eczema following trauma was a cause for compensation in Louisiana.<sup>10</sup> An employee's environment is considered in judging whether a case is industrial. One needs no court decision to decide that a man who develops a dermatitis on his lower legs after standing many hours in an irritating oil should be compensated.<sup>11</sup>

Allergy susceptibility<sup>12</sup> sensitization<sup>13</sup> and idiosyncrasy<sup>14</sup> are terms which make the application of the laws extremely difficult. When testimony conflicts upon the question whether the return of the dermatitis is due to a new exposure to irritants to allergy, to sensitization or to idiosyncrasy, difficulties begin to appear which seem to be more concerned in deciding the actual facts than in applying the law. In Massachusetts it is the rule that the decision is governed not so much by legal principles as by the determination of the issue whether the employee's present condition is due in fact to the original exposure or to something else.<sup>15</sup> The aggravation of a nonindustrial skin disease is compensable, and since it is difficult at times to determine the part played by the occupation an employer when employing a person with a skin disease, should note exactly the extent of his eruption at the time of employment.

The majority of diagnoses are fairly clear cut but a certain number remain undetermined

despite investigation. If the consultant dermatologist decides the case to be industrial, the insurance company rarely refutes the claim, but, with a negative opinion the claimant frequently appeals to the Industrial Accident Board and a hearing of the evidence of both parties results. If the commissioner needs further medical support, the claimant is examined by an impartial dermatologist.

As a result of many years of experience and the extreme powers of the Massachusetts Industrial Board many confusing problems have been solved but there are still many instances in which it is apparent that complete justice has not been rendered to both parties. With the compensation laws embracing industrial dermatoses there will be no need of dermatologists stretching a point in defining dermatologic entities. Even if the patient is an industrial worker an individual with a skin disturbance of unknown etiology should not receive compensation unless definite chemical and scientific proof can remove the cause of the disease from obscurity. Within a week there were seen for diagnosis and opinion two cases of dermatitis exfoliativa of months' duration. One was an Italian laborer 48 years old whose condition was thought by his physician to arise from contact with poison ivy while pulling roots, although no evidence was shown that poison ivy was present and the patient stated that at no time had there been vesiculation, the other was a Scotch crane hoister's helper in a gelatin factory where contact with lime was attributed as the causative factor of his eruption.

Sulzberger<sup>16</sup> has outlined many outstanding imperfections in various compensation laws and has made some excellent constructive suggestions which should be read by all interested in this particular study. If an untrained worker suffers an incapacitating dermatitis from an occasional occupation and then returns to this job when other work is available it would seem that this individual has ulterior motives. Industry should not be compelled to pay compensation merely because an individual is unfit to perform certain types of work. The Massachusetts Workmen's Compensation pays compensation only for a personal injury arising out of and in the course of employment. It affords no remedy for disease industrial or otherwise contracted in the course of and arising out of the employment. Its relief is confined to personal injury.<sup>17</sup> The interpretation of the words, personal injury, is left to the courts in construing the statute. A problem which is sometimes presented is that of the conscientious employee, who continues his work despite an industrial dermatitis and is able to accomplish all his tasks until lack of work lays him off. The question then arises is he entitled to compensation? These cases depend on



the patients condition and the medical testimony as to the patients' disability for other work. The justice of the decisions in all these cases depends on the impartiality of the commissioner and the presentation of the true facts by competent and honest counsel for each side. The number of industrial dermatoses hearings would be much fewer if these cases were seen early by a dermatologist trained in industrial work.

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## VERMONT STATE MEDICAL SOCIETY

MY PERSONAL EXPERIENCE WITH THE  
EXTRAMURAL SERVICE\*

BY FRANK C. PHELPS, M.D.†

THE Extramural Service of the Medical Department of the University of Vermont might be called the E M S of the U V M but should not in any way be connected or confused with the N R A, the V E R A the X Y Z or any of the numerous government projects now functioning or attempting to function. Neither should it be associated with the potato control, for this E M S was conceived and given birth solely in the minds of the faculty of the Medical Department of the University of Vermont and so far as I have been able to ascertain no other Medical College in the country had ever attempted or carried out a project of this sort. Since then, however, I believe it has been inaugurated in some lesser degree in one or two of the Western Colleges.

While I fully realize how well prepared the medical student of today is in comparison with the student of my day of over forty years ago or even of thirty or twenty or ten years ago, I at the same time believe that the Extramural Service is of inestimable value to the graduating class.

This Extramural Service was started in the Fall of 1928, has been followed up with some modifications or improvements since that time, and I hope and believe, will continue to be of great benefit and help to the student.

As most of you undoubtedly know, the graduating class of the Medical Department of the U V M is divided equally, part of the class staying in the classroom taking lectures and other instruction, while the other part is sent out to the various hospitals, institutions and a few general practitioners in the state, the stu-

dents alternating so that each one has a certain period of time for study, observation or actual practice at each place. At the end of the first semester this half of the class returns to the college and the other half takes its turn at the E M S.

I shall speak only of my personal experience with the students as a country doctor with the additional help of the work at the hospital of the Vermont Industrial School. During the first two years of this service students were sent out two at a time and their stay was for two weeks at each place. This did not work out so well as it did later when one came alone because it was a demonstrated fact that when two came together one of the students usually did most of the work and oftentimes the other was quite willing to let him do it.

After the first two years one student was sent to me every two weeks. This was much better for the students, than coming in pairs. For the past two years, however, one student has come alone and stayed for four entire weeks. This has been very much more advantageous for the student as well as much greater help to the preceptor, for it is very plain to see that the more a student does to help and relieve his preceptor the more benefit and experience he, himself, is getting.

I have been physician in charge at the Vermont Industrial School for the past thirty five years where we have a small hospital with a trained nurse constantly in attendance. Much experience can be gained by the student there, for we usually have at the hospital from ten to twenty patients and many more coming each day for examination, treatments, dressings, and so forth. While all of this is done under my personal supervision and everything except that of the most trivial nature thoroughly checked,

Read at the Annual Meeting of the Vermont State Medical Society at Rutland Vt. October 17 1935

†PHELPS, Frank C.—Preceptor Extramural Service Medical Department University of Vermont College of Medicine. For record and address of author see "This Week's Issue" page 591

at the same time I endeavor, so far as possible, to give the student a free hand to diagnose prescribe and treat cases as he thinks best. I am perfectly frank to say that seldom do I find it necessary to criticize the diagnoses of the students or make any radical changes in the treatment that they prescribe.

As each child is admitted to the Industrial School, he is left at the hospital, isolated for a period of two weeks lest he may have been exposed to some contagion that would be passed on to the others. During this time the children are given a very careful physical examination, they are measured and weighed, the family history is taken, they are vaccinated, given the immunizing serum for diphtheria, a Wassermann blood test is taken and the urine is examined. Besides all this they are given a thorough mental test. Most of this work is usually done by the student and it gives him at least some practical idea of examinations and preventive medicine.

Our adenoidectomies and tonsillectomies are taken care of by our local specialist, assisted by the student who is on duty at the time. Our appendectomies and any major surgical cases, however, are sent to the Mary Fletcher Hospital for operation and our fractures are sent up for x-ray. When possible I have the student accompany the patient to the hospital that he may see for himself how nearly correct is the diagnosis that we have made.

Our V I S hospital has a capacity of 40 beds but, as the population of the school is less than 300, of course it is seldom full except during an epidemic of grippe or measles or some other contagious disease. The minor ailments of childhood, weed poisons and slight injuries, are many and varied, however, and provide the student with many cases to look after and treat.

Another valuable experience for the young doctor is to be able to detect a malingerer from a real case, for even children, especially those in institutions, are able to assume many symptoms, and, to avoid work or punishment for some misdemeanor, will appear to be in a state of collapse or just ready for an emergency appendectomy or some other impending catastrophe. I am free to confess that, with my more than forty years experience, I am often at my wit's end so that I have much sympathy for the undergraduate who hesitates to make a positive diagnosis. My advice is always to give the patient the benefit of the doubt rather than wait and take the chance of a ruptured or gangrenous appendix. The eruptive fevers are more or less of a study for the young doctors as very few of them I have found have seen cases of scarlet fever or even measles or chickenpox. Fortunately for the students, I have often been able to show them actual cases and they find them quite different from the

descriptions and colored pictures in their books and the impressions made on their minds in these cases are lasting.

As a rule, the work at the Vermont Industrial School Hospital keeps the students busy much of the forenoon. In the afternoon they come to my office to assist or examine such cases as I am able to let them see, help with dressings, do urine examinations, blood tests, and so forth. After office hours I take them out with me to see patients in my general practice and I will say that seldom does a patient find fault because I have a young doctor along. Of course I am obliged to use some discretion in the matter, for occasionally patients will say that they would rather I came alone as it makes them nervous when I have a young doctor with me. This is sometimes offset by having another person call in and say he would just as soon have the young doctor come in my place. Of course I gladly send him although I wonder if it is because I am slipping or just growing old.

These calls give the student an idea of how to act and appear in the sickroom, perhaps I should say it gives him an idea of how I act and appear under the circumstances which may be entirely different from the way any other doctor might do. But at least it shows him that private practice is quite different from hospital routine and that oftentimes the family and relatives of the patient need more attention and instruction than the patient himself. After taking the young doctor with me for a few days, I give him a medicine case and emergency bag, the exact duplicate of the one I carry and let him see patients and make calls by himself. If possible I take or send him to an obstetrical case and many times he has conducted the delivery or had a case in the country all by himself. The instruction the student has in obstetrics at the present time, while not so different perhaps from that given us by that wonderful old man, Professor A. F. A. King, the manikin now used and the rubber infant appear almost human while the pelvic manikin of Dr. King resembled the female genital organs about as much as it did the Grand Canyon and I am sure the infant's head was a croquet ball he brought up from the city, pilfered from some youngster's backyard.

One idea that I try rather forcibly to impress upon the undergraduate is the fact that frequently he must work out for himself a diagnosis and decide immediately on some treatment without the aid of any of the diagnostic helps he has been familiar with at the hospital. For a case seen ten or more miles distant in the country on a stormy night, may need very urgent care. Microscopic or laboratory tests may not be available and delay in such a case may prove very serious or even fatal. To be sure in many

cases experience alone is of the utmost value, but I tell the students to use their heads and then hands as we all were obliged to do years ago and they will be working on the right side as nearly as possible

I should feel very much at fault if I did not mention the fact that one of my daughters who has been my able assistant for the past few years, while not a trained nurse, has been of very great help to the undergraduates in many ways, going with them to make calls when I am unable to go myself and giving them advice and confidence in themselves that so many of them sometimes need. She also gets a few snap shots, and keeps an album which helps in following the students through the years after they have been under my preceptorship

At the end of each student's period of service I ask him to hand in a form showing how many patients he has seen each day with me, how many calls he has made with me and how many alone, the number of discharges he has done, treatments given, and so forth. It is surprising to know that, sometimes, in the four weeks' time the grand total adds up to 600 or more. This blank is forwarded to the office of the Dean as is also a blank called the preceptor's report on which is indicated the preceptor's estimate of the qualifications of the student in regard to his initiative, insight, adaptation, application, responsibility, accomplishment, personality and conduct

I am not certain just how much my report has to do with the final marks of the students but I will say this, that so far none of them have failed to graduate so I am hoping that the service with me has been of some help

I also understand that the student sends in a blank to the Dean stating his opinion of the preceptor and of the service he has had, but, unfortunately, I have never yet been able to see one of these reports so, am unable to know just what reaction the student gets. I want to say, in closing, however, that it is a very great pleasure to me to have the young doctors call at my home a year or more after graduation, stay a few hours, talk over old times and old patients that they remember and let me know how they are progressing. If they speak well of the Extramural Service and say that the weeks they had with me were profitable, I feel fully repaid for the time and instruction I was able to give them

### MISCELLANY

#### VERMONT STATE MEDICAL SOCIETY

##### ANNUAL MEETING

At this date it is expected that the following papers and addresses will be presented at the 123rd Annual Meeting of the Vermont State Medical Society

to be held in Burlington Vermont, October 15 and 16. The order in which the papers will be presented is not final and additional charges of a minor nature may be made

Vice Presidents Address John Trotter Jr. M.D., Bennington Vermont

Maternal and Child Health Paul D. Clark, M.D., Burlington, Vermont

Hemorrhage Into or Beneath the Rectus Muscle. Thomas S. Cullen M.D. Baltimore Maryland.

Presidents Address L. W. Burbank M.D., Cabot Vermont

Heart Disease in Middle and Past Middle Life J. H. Upham M.D. Columbus Ohio President Elect of American Medical Association

Postoperative Pulmonary Atelectasis A. D. Rood M.D. Springfield Massachusetts

Respiratory Dust Diseases R. R. Sayers M.D., Washington D. C.

Symposium Arranged by Reginald H. Smithwick M.D. Boston Massachusetts

- 1 Medical Aspects of Vascular Disease Robert S. Palmer, M.D. Boston Massachusetts
- 2 General Management and Treatment of Peripheral Vascular Lesions in Diabetics and Non Diabetics Theodore C. Pratt M.D., Boston Massachusetts
- 3 Special Methods of Treatment of Peripheral Vascular Lesions (Discussion of Passive Vascular Exercises Peripheral Nerve Block Embolectomy and so forth) Robert R. Linton M.D. Boston Massachusetts.
- 4 Present Methods of Treating Varicose Veins Henry H. Faxon M.D., Boston Massachusetts
- 5 The Value of Sympathectomy in the Treatment of Vascular Disease (Raynaud's Disease Angina Pectoris Essential Hypertension) Reginald H. Smithwick M.D. Boston Massachusetts

#### VERMONT DEPARTMENT OF PUBLIC HEALTH

JULY 1936

The following communicable diseases were reported to the office of the Department of Public Health during the month of July: chickenpox 24 German measles 12 measles 69 mumps 45 scarlet fever 15 typhoid fever 5 undulant fever 2 whooping cough 34 and poliomyelitis 5

The Laboratory of Hygiene made 2148 examinations the details of which are as follows

Examinations for diphtheria bacilli	92
Widal reaction of typhoid fever	80
undulant fever	102
gonococci in pus	151
tubercle bacilli	136

Examinations for syphilis .....	723
of water chemical and bacterio	
logic .....	205
water bacteriologic .....	348
milk market .....	213
milk submitted for chemical	
only .....	3
milk submitted for microscop	
ic only .....	0
foods .....	1
drugs .....	0
for courts autopsies .....	1
courts miscellaneous .....	20
miscellaneous .....	3
Autopsies to complete death returns .....	0

The Director of the Division of Venereal Diseases reports 54 cases of gonorrhea and 55 cases of syphilis made to this Division in July. Six hundred and thirty-two Wassermann outfits and 200 slides for gonorrhea were distributed from this Division.

The Crippled Children's Division made 232 home visits calling on 225 patients. Forty-two Social Service calls were made. Two patients were admitted and one discharged from the Rutland Hospital; one patient was discharged from the Massachusetts General Hospital and three patients discharged from the Audubon Hospital. Thirty-four pieces of ap-

paratus were fitted. 31 Orthopedic corrections to shoes were made and 11 pieces of apparatus were repaired. The Vocational Worker of this Division reports sales made amounting to \$92.90.

The Division of Public Health Nursing reports the past month was spent mostly in planning and organizing a new program. Three new nurses were added to the staff making a total of four field nurses now on duty. This department sponsored a Public Health Institute at Fletcher Farm this month with a total registration of 63 nurses, physicians and lay people. During the month of July 479 notifications of birth registration, 168 baby booklets and 150 diphtheria consent cards were mailed out.

## DEATH

**LENAHAN**—JOHN P. LENAHAN, M.D., of Bellows Falls, Vermont, died April 2, 1936, following an appendix operation. He was born in Hudson, New Hampshire, March 3, 1878. He was graduated from the University of Vermont Medical College in 1902 and had practiced surgery and medicine for the past thirty-one years in Bellows Falls. He is survived by his widow, Mrs. Catherine E. Lenahan, and one daughter, Ruth, both of Bellows Falls.

## THE ONLY SAFE MILK

Especially will it bear reiteration that the modern object of pasteurization is not to make bad milk passable; it is not to make poor milk good and it is not to excuse or to permit of insanitary methods of production and handling. Again and again great milk-borne epidemics have been traced not to the filthy product of a dirty producer but to the high-grade dairymilk, to the dispenser of low-count milk. Typhoid, diphtheria, and septic sore throat organisms will grow just as luxuriantly in high-grade milk as in that of the lowest grade, and these diseases can as readily find their way into the high-class dairies as into the cheapest of cow barns.

Because of the fact that some persons continue to work in dairies even when they are ill and because the most reliable tests sometimes fail to detect the presence of disease in cattle and in carriers, one can have no positive assurance as to the continuous all-the-year-round safety of even the best raw milk supply. One of the greatest epidemics of modern history, involving over two thousand cases and many deaths, started from a dairy which was watched over by a well-known sanitarian, a professor at one of the leading institutions of learning.

Finally, a fact worthy of emphasis is that while the use of raw milk has again and again been proved responsible for the transmission of a great number

of communicable diseases, it is the experience of all of our larger cities that not a single case of this character has ever been traced to a properly pasteurized milk supply.—*Health, August, 1936*  
*Issued monthly by N. H. State Board of Health*

## DO YOU KNOW?

The first mastoid operation was reported by J. C. Hutchinson in the Transactions of the Medical Society of the County of Kings, Brooklyn, N. Y., Vol. 2, No. 31 (1865).

Napoleon, in 1805, ordered his entire army vaccinated. This was only nine years after Dr. Edward Jenner made his great discovery. Today more than a century and a quarter later, epidemics have been eliminated as a result of vaccination, but there are still those who refuse to accept facts and offer themselves as candidates for smallpox by neglecting to be vaccinated.

No child should enter school unless he has been vaccinated against smallpox and inoculated against diphtheria. Important as are new clothes and new books, they can be replaced if lost, not so with life itself. Toxoid is simple, harmless, and immunity is certain. Vaccination has become almost universal.—*Excerpts from the Bulletin of the New York State Medical Society*

# CASE RECORDS of the MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED  
IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

FOUNDED BY RICHARD C CABOT, M D

TRACY B MALLORY, M D, *Editor*

## CASE 22391

### PRESENTATION OF CASE

A fourteen year old white American school-boy was admitted complaining of bloody diarrhea

About eight months before admission while at school the patient was suddenly seized with a desire to move his bowels. He passed a profuse blood stained watery stool at this time and had five or six similar bowel movements during the succeeding twenty-four hours. He was then seen by a physician and put to bed. A soft diet with milk of bismuth was prescribed. There was no associated discomfort of any kind. He remained in bed for two weeks and the diarrhea gradually subsided. Shortly thereafter he returned to school and, except for five or six bloody watery bowel movements at scattered intervals, he remained quite well. One month before entry while playing, he again had a sudden desire to defecate. At this time he passed a copious bloody stool which was associated with some tenesmus. For the following week his mother attempted to treat him with milk of bismuth but he continued to pass five or six bloody stools daily. He felt quite well and was ambulatory during this time, but soon was put to bed and placed upon a liquid diet. A week later, since he had shown no improvement, he was sent to a hospital. X-rays taken there showed "ulcers of the rectum." By this time he was having six to eight bowel movements per day and four or five at night, all of which were bloody but were not associated with any subjective symptoms. Operation was advised, but was refused, and the patient was transferred to this hospital.

The past history is noncontributory except for the fact that the patient had never been very robust.

Five paternal aunts were said to have had pernicious anemia.

Physical examination showed a pale weak looking, thin boy lying in bed in no discomfort. The mucous membranes were pallid. The

heart was enlarged slightly to the left but was otherwise negative. The blood pressure was 92/74. The lungs were clear. No other positive physical findings were recorded.

The temperature was 100.4°, the pulse 112. The respirations were 24.

Examination of the urine showed a specific gravity of 1.016 and a slight trace of albumin. The sediment contained 110 white blood cells and a rare red blood cell per high power field. The blood showed a red cell count of 4,630,000 with a hemoglobin of 75 per cent. The white cell count was 13,850, 76 per cent polymorphonuclears, 10 per cent lymphocytes, 9 per cent monocytes and 5 per cent eosinophils. The stools were soft, watery, reddish brown, and contained large amounts of both red and white blood cells. Warm specimens were found to contain many nonmotile, oval shaped, thick walled organisms resembling monilia. No amebae were seen. A stool culture was negative. A Hinton test was negative. The serum protein was 6.4 grams per cent. Agglutination tests for typhoid, paratyphoid and dysentery were all negative. A tuberculin skin test was negative.

A barium enema passed through the ileocecal valve promptly. The descending colon was seen to be somewhat narrowed and contained fluid. The walls were rather smooth and there was shifting spasm in this region. X-ray examination of the chest was negative.

On the second day a proctoscopy showed granular bleeding surfaces with many small ulcerations. The patient was treated with dietary regulation, repeated transfusions and emetin hypodermically. The temperature fluctuated daily between 99° and 103° and the frequency of his bowel movements remained unchanged. His abdomen became moderately distended but was not rigid or tender. By the end of his second week the temperature returned to normal and the frequency of the bowel movements lessened. Two weeks later there was an exacerbation of the bloody diarrhea and the patient began to complain of pain in the rectum. There was a slight febrile rise and on the twenty-sixth day an ischiorectal abscess was incised and drained. On the following day an ileostomy was done. Although there was no postoperative febrile reaction the patient appeared to be quite feeble. His appetite became quite poor. On the forty-first day in order to combat anorexia a high jejunostomy was done for feeding purposes. The temperature remained within normal limits. The pulse was persistently elevated between 100 and 120. Shortly after the operation the patient began to vomit repeatedly, became rapidly weaker, and died on the forty-fourth hospital day.

## X-RAY INTERPRETATION

DR GEORGE W HOLMES I have a film of the chest which I presume was taken to rule out tuberculosis or metastatic malignant disease. The lung fields are clear. The heart shadow looks a little large and round. I do not think it is necessarily abnormal. The absence of tuberculosis in the lungs does not rule out tuberculosis in the intestinal tract although it makes it less likely.

This is an examination of the lower gastrointestinal tract by means of a barium enema. It does not show anything characteristic. I have read the note given in the history and it does not give me any help. I think it would be very difficult to make anything but a negative diagnosis from this film alone. One should have the fluoroscopic observation and films taken of any suspicious area. The proximal colon as far as the splenic flexure looks fairly normal. Beyond that I would not dare to hazard any sort of opinion. The fluoroscopic note says "Appearance is that of generalized inflammatory process in the descending colon. No definite ulcer demonstrated." I cannot dispute that statement.

## DIFFERENTIAL DIAGNOSIS

DR THOMAS V URMY We have then a fourteen year old schoolboy with a history of eight months of bloody diarrhea. First he had an attack lasting about two weeks, then a period of six months of relative freedom and then another attack lasting a month before he entered the hospital.

Examination of the stools confirmed the history in that they contained large amounts of blood, were loose and watery, and in addition contained a considerable amount of pus. A source of pus and blood was readily found by proctoscope so that it seemed perfectly fair to make a diagnosis of some type of colitis.

The x-ray is of some help here because it shows changes in the lower half of the colon but not in the right half. The colitis is thus apparently limited chiefly to the lower colon.

The differential diagnosis would include four types of colitis: tuberculous, amebic, bacillary, and the so-called idiopathic. All of these conditions were undoubtedly considered. Tuberculosis was not suggested by the proctoscopic examination, since none of the large shaggy ulcerations which are more typical of this disease were seen. The x-ray also showed no disease in the region of the cecum, where we know tuberculosis of the colon almost invariably begins. Further proof was the negative chest x-ray for although tuberculosis of the colon does occur without chest tuberculosis, the incidence in nonpulmonary cases is very low. A further attempt to settle the question was made

by doing a tuberculin test which was negative.

Amebic dysentery is the next thing to be considered. Proctoscopy did not show the typical discrete, punched-out ulcerations in an otherwise fairly normal appearing mucosa but we cannot rule it out on this examination alone. They searched the stools carefully and could find no amebae, and this study if done properly is of great value in settling the question. To be doubly sure, however, a course of emetin hypodermically was given. I judge from the course that there was no striking clinical change after three or four days of treatment as should be expected if the etiologic agent was the ameba.

Cultures and agglutination tests for bacillary dysentery were negative. This is about as much as can be done toward ruling out this disease but such evidence is by no means absolute because we know that the stools in bacillary dysentery are usually negative to culture after the first week. The acute onset of our case might be considered consistent if not suggestive. A number of recent investigators feel that bacillary infection is more common in this country than previously considered and that a certain number at least of the so-called idiopathic cases are really chronic bacillary dysentery. People who have had experience with both diseases cannot, I understand, distinguish between the two so far as the proctoscopic appearance is concerned. We will have to leave the question open and say only that we have no positive evidence of bacillary dysentery.

We are left then more or less by exclusion with the disease called idiopathic ulcerative colitis. A "granular bleeding surface with many small ulcerations" sounds very typical. The fact that the process was more marked in the lower part of the colon is also quite distinctive. Another point in favor of idiopathic colitis is pus in the stools. Pus is not often found in amebic disease whereas it is always present in idiopathic colitis. Finally, idiopathic ulcerative colitis is much more frequent in this section of the country than any of the other diseases considered.

The note here of "non-motile, oval shaped thick walled organisms resembling monilia" is interesting, but I think it is very probable that these were just yeast given as a dietary adjunct.

There is also a report of a good many white cells in the urinary sediment. I do not know what that means. It is not common in these conditions to have urinary infections. Without further notes I do not think we can say anything. The albumin can be explained by the fever.

As to the question of the cause of death, the patient's whole course was apparently downhill—a short first attack, a fairly long remis-

sion and then a much more severe second attack beginning a month before he came in and continuing for two weeks after admission. The colitis flared up again after two weeks, in connection with the development of an ischio-rectal abscess. At this time his appetite was poor and apparently with this loss of ability to assimilate food he failed very rapidly, as these cases always do, until the time of the second operation, which I judge was a desperate attempt to save him. The vomiting which began shortly after may have been the reflex from the colon and not due to a new complication although we know peritonitis is very common in these cases as a terminal event. It is possible that there may have been obstruction, although it seems too early for that. I have seen one case recently with a mesenteric thrombosis which produced such a final picture. I do not think I can come any closer than that. I think the patient was going very steadily downhill and would have died very soon whether he developed a perforation of the bowel, or other sudden complication. He was running a pulse of 120 which is a very poor sign. Inability to take nourishment may well have been the most important factor in his death, because ordinarily two weeks after ileostomy if the patient can take food he recovers as far as his general health is concerned.

#### CLINICAL DISCUSSION

DR CHESTER M. JONES: This patient presented the usual difficult problem of whether to transfuse or not. The chief difficulty is when to operate. When he came on the service he was undernourished and it was impossible to get him into shape. Drugs were tried without any effect. We finally decided to assume the risk after he had pulled through one bad episode and he was transferred to the surgical service and operated upon.

DR LELAND S. MCKITTRICK: I should like to ask one question. Both Dr Holmes and Dr Army have brought out the point of negative chest x-ray in excluding tuberculosis. I wonder if they might not agree that a negative chest x-ray does not exclude tuberculosis of the more localized type but that a diffuse tuberculous colitis is an end result of pulmonary tuberculosis and is essentially always associated with chest findings, that is, in the diffuse process which is visible by the proctoscope, such as this was, the negative chest plate would exclude tuberculosis.

This boy presented a difficult problem. They asked me to see him during the time he had the acute flare up with fever. He was considered extremely sick and we gave a great deal of thought to an ileostomy as an emergency measure. We made the usual decision to "wait twenty-four hours" in the hope that he might

show some improvement. He did so far as his chart was concerned. The fever came down and we had every reason to believe he had survived the acute episode and was going to straighten out. He had the ileostomy done at a later stage because the clinical course was not in keeping with the clinical chart. He went progressively downhill was nauseated, continued to have a good deal of discharge by rectum. Ileostomy was then done in the hope that it might be possible to feed him and bring him back. It was totally inadequate. He went progressively downhill. The ileostomy made no difference whatever. It apparently did him no harm, and certainly was of no benefit. Jejunostomy possibly should have been done a good deal earlier but I am inclined to believe that he had some process that made him go downhill so fast. Apparently feeding would not have been of value.

#### CLINICAL DIAGNOSIS

Ulcerative colitis

DR THOMAS V. URMY'S DIAGNOSIS

Idiopathic ulcerative colitis

#### ANATOMIC DIAGNOSES

Acute ulcerative ileitis

Chronic ulcerative colitis, healed

Operative wounds. Recent—ileostomy, jejunostomy, old—incision and drainage of ischio-rectal abscess.

#### PATHOLOGIC DISCUSSION

DR TRACY B. MALLORY: The autopsy showed a rather unusual picture for a case that clinically seemed an ordinary enough ulcerative colitis. The colon was practically negative. The sigmoid showed a few ulcerations and the entire colon was slightly thickened but in general free from ulcerations, free from congestion or evidence of inflammation. In contrast the entire ileum up to the beginning of the end of the jejunum was filled with acute ulcerations of the same type that one usually sees in the bowel, so I think that explains well enough why the ileostomy had done no good. The ileostomy was at the lower end of the ileum and he still had some eight feet of ulcerated ileum up above it. Whether that was present at the time Dr McKittrick did the operation of course I cannot say, certainly it probably was not so marked.

DR MCKITTRICK: That is interesting because although I have not looked at the operative note I recall no gross change in the loop of ileum that was brought out. I explored down in the cecum and brought out whatever was in sight, but I noticed nothing abnormal about the ileum.

DR MALLORY: A certain proportion of these



cases of colitis and, in my experience, young individuals in particular do show extension of the process above the ileocecal valve and a certain distance up the ileum usually a matter of a few centimeters at most whereas in this case the entire ileum was involved. The fact that at the time of autopsy it so completely involved the ileum brings up the possibility that you might confuse a condition such as this with regional ileitis. Histologically the ileum in this case shows the usual changes that one finds in the colon of the average ulcerative colitis case but it does not show the marked invasion of the deeper layers of the wall the tendency to fistula formation and the focal accumulations of mononuclear cells and giant cells that are so characteristic of typical regional ileitis cases.

DR ALLEN: Would not the discharge from the ileostomy give the clue to the involvement of the ileum clinically before autopsy?

DR McKITTRICK: It may have been there but we did not pick it up.

DR MALLORY: One would think that it would be pretty evident.

DR ALLEN: May I ask Dr McKittrick if he feels that an earlier operation would have given any better result in this case?

DR McKITTRICK: In view of the autopsy finding I should think not. At the time of death I had a feeling that I should have done the ileostomy when I first saw him but I am sure in view of the autopsy findings that it would not have made any difference.

## CASE 22392

### PRESENTATION OF CASE

*First Admission* A forty-six year old Canadian housewife was admitted complaining of pain on defecation.

During the nine months preceding her entry the patient had become constipated and suffered from severe pain when defecating. The movements were quite small in amount and a month before coming to the hospital she passed about two cupfuls of fresh blood by rectum. Subsequently there was a small amount of bleeding with each bowel movement. She had lost about thirty-five pounds in weight.

Physical examination was negative except for examination of the rectum. The palpating finger caused considerable pain and on the posterior wall of the rectum just within reach of the finger there was a large boggy irregular cauliflower-like growth with many papillomatous projections. Shortly after entry a combined abdominoperineal resection of the rectum was performed. The pathological report showed adenocarcinoma of the rectum with no involvement of the regional lymph nodes. Post-operatively the patient had a thrombophlebitis

of the left leg from which she recovered. She was discharged a month after the operation.

*Second Admission* five years later.

The patient returned stating that ever since her operation she had been troubled with gaseous eructation and had been markedly constipated. Catharsis produced severe nausea occasional fainting and diarrhea. There was frequent palpitation particularly when she was constipated. For about two years previous to this entry her catamenia had been becoming irregular and scanty.

Physical examination showed that the heart was not enlarged but there were frequent extrasystoles. The blood pressure was 160/90. The lungs were clear. The colostomy wound was normal in appearance.

Examination of the urine was negative. The blood showed a red cell count of 4,500,000, with a hemoglobin of 75 per cent. The white cell count was 8,000. 62 per cent polymorphonuclears. The stools were ribbon in appearance but gave a negative reaction to the guaiac test. The Wassermann test was negative. An electrocardiogram showed a sinus arrhythmia only. T<sub>2</sub> exhibited low amplitude.

A gastrointestinal series showed no evidence of organic disease of the stomach or duodenum. A barium enema through the colostomy orifice showed no evidence of abnormality of the colon.

The patient was given dietary advice and discharged two weeks after re-entry.

*Third Admission* three years later.

Shortly after her last discharge gaseous distention and constipation returned. She was still unable to use cathartics and enemata produced nausea. The bowel movements were well formed and never contained blood but occasionally contained large amounts of mucoid material. A year before re-entry she became troubled with hot flashes and considerable weakness which frequently confined her to bed. She lost ten pounds in weight.

Physical examination was not remarkable, except for the fact that the colostomy opening was so small that it did not admit a catheter the size of a lead pencil.

The colostomy wound was widened mechanically, the patient given further dietary advice, and she was discharged on the second hospital day.

*Final Admission* eight years later.

The patient was now sixty-two years of age. She continued to have her abdominal discomfort very regularly following her last discharge. This was characterized by an indefinite pain, "like gas" in the upper abdomen which was more marked when the patient was constipated. Three years ago the pain was quite severe and persisted for several hours. It was finally relieved by an enema. Two weeks ago she had a similar attack which was again relieved by an

enema Twenty-four hours before coming to the hospital a similar attack was initiated and an enema administered The pain this time, however, was continuous in character rather than cramp-like and prevented her from sleeping The return of the enema which had been administered about six hours after the onset was clear At the same time she vomited watery material Several hours after the first enema a nurse administered another enema with a small catheter There was no return at all from this enema She vomited twice afterward and her abdomen became swollen The pain continued with such severity that morphin was necessary for relief but there was no further vomiting At no time during the preceding fifteen years had such a therapeutic measure been required

Physical examination showed a very sick, dehydrated, elderly woman with dry, heavily coated tongue The pupils were equal but constricted The heart and lungs were negative The abdomen was distended and generally tympanic Auscultation revealed no peristaltic sounds No masses, spasm or tenderness was elicited The colostomy wound contained a small polyp at its orifice but was otherwise not remarkable A digital examination was negative A vaginal examination showed a fixed posterior wall with a soft bulge in the anterior vagina No masses were felt

The temperature was  $104^{\circ}$ , the pulse 100 The respirations were 40

Examination of the urine was negative The blood showed a white cell count of 4,000

Shortly after entry an exploratory laparotomy was performed

#### DIFFERENTIAL DIAGNOSIS

DR ERNEST M DALAND From the first admission it is apparent that this patient had a typical carcinoma of the rectum, with the suggestion that it may have arisen in a polyp No lymph nodes were involved The prognosis for cure should be good

On her second admission she stated that she had had constipation and gaseous eructation ever since her operation It could not have been bad or she would have returned before five years had elapsed She was passing through the menopause

The statement that the colostomy wound was normal in appearance means little without knowing the size of the opening The fact that the stools were ribbon-like in appearance means to me that the opening was very small, the stools taking the size of the outlet Small stools mean a constriction of the outlet, not constriction higher up

X-rays of the gastrointestinal tract were negative and apparently no small intestine obstruction was made out

The only positive finding in her second ad-

mission was the small colostomy opening, with constipation

Her third admission was three years later when again she had the same symptoms and again she was unable to take cathartics or enemas There had never been any blood in her stools She had passed through the menopause The only important finding on this third admission was the fact that the colostomy opening was smaller than a lead pencil When this was stretched up she was able to return home and carry on for another eight year period

On her next admission her interval story is much the same as previously All her symptoms again point to a chronic obstruction at the outlet with extreme constipation and probably fecal impaction The vomiting at the time of the first enema does not seem significant After the second enema things began to happen. The contents of the enema were lost, presumably through a perforation by the enema tube Vomiting, abdominal distention and pain began at once The picture was then one of peritonitis due to perforation with a silent abdomen, distention, vomiting, high temperature, pulse and respiration The small polyp found at the opening of the colostomy wound is not particularly significant The mass felt in the posterior wall of the vagina was scar tissue from removal of the rectum The low white cell count, 4,000, indicates a complete lack of response of the peritoneum to the infection At the time of her admission the picture was one of general peritonitis The only thing suggesting an acute obstruction was the pain beginning on the last day before any enema was given This was probably due to fecal impaction Personally I would not have operated without previous Ochsner treatment

#### CLINICAL DISCUSSION

DR CLAUDE E WELCH\* This patient was extremely ill at entry The differential diagnosis lay between intestinal obstruction and general peritonitis With her recurrent attacks of abdominal pain, vomiting and constipation, we considered intestinal obstruction from herniation to the lateral side of the stoma to be the more probable diagnosis The high temperature which was present on entry we thought represented gangrene of the obstructed loop After the patient failed to respond to the usual measures on the ward, and since she was apparently going downhill rapidly, it was decided as a last resort to do an exploratory laparotomy with possible relief of the distention by ileostomy Accordingly an incision was made lateral to the colostomy The intestines were dilated and covered with fibrin and there was evidence of general peritonitis Because of the

\* Resident on East Surgical Service

poor condition of the patient a thorough search for the cause of the general peritonitis could not be made. Postoperatively she failed rapidly and died approximately twelve hours after operation.

#### CLINICAL DIAGNOSES

Intestinal obstruction acute ? carcinomatous  
Perforation with peritonitis

#### DR ERNEST M. DALAND'S DIAGNOSES

Perforation of the sigmoid  
General peritonitis  
Chronic intestinal obstruction from tight colostomy  
Fecal impaction  
Postoperative carcinoma of the rectum without recurrence  
Polyp of the sigmoid

#### ANATOMIC DIAGNOSES

Perforation of the colon (traumatic?)  
Peritonitis acute generalized  
Operative wounds. Recent, ileostomy. Old colostomy combined abdominal perineal resection of the rectum  
Cholecystitis chronic  
Cholelithiasis

#### PATHOLOGIC DISCUSSION

DR TRACY B. MALLORY. At the postmortem examination we found of course the generalized peritonitis which had been noted by the sur-

geons when the laparotomy was done. At this time a wide perforation in the wall of the colon close to the colostomy opening was quite obvious. It measured a centimeter in length and five-tenths of a centimeter in breadth. It is however almost certain that the wound had opened up wide in the interval between the time of operation and of autopsy. In a moribund patient healing is a very slow process and very often fails to keep up with an ulcerating infection. The opening was close enough to the colostomy so that it might easily have been caused by the tip of an enema tube and I have little doubt that the patient actually did injure herself in attempting to administer the enema. One ordinarily forgets that there is any possible danger in such a simple procedure. I have however seen two other fatalities which seemed to be directly traceable to the same situation. I think it is very doubtful if the point of the tube is very often actually forced through the bowel wall but minor abrasions could of course easily be brought about. If organisms of exceptional virulence are present in the intestinal mucosa or if the patient's resistance is seriously depressed a very minor lesion of this character may occasionally be followed by rapid destructive extension of the process leading eventually to the point of rupture.

We found nothing at the time of autopsy to suggest any recurrence of the carcinoma for which she was originally operated upon. She did have however a chronic cholecystitis and gall stones.

# The New England Journal of Medicine

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THE BOSTON MEDICAL AND SURGICAL JOURNAL

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## THE CONSERVATIVE TREATMENT OF ACUTE OSTEOMYELITIS

WHENEVER any generalization becomes so widely accepted as to be looked upon as an axiom, a little scrutiny is likely to reveal its falsity. This seems to be particularly true of the surgical dictum, "Where there is pus let it out." A consideration of the change in the treatment of acute salpingitis, general peritonitis and septic abortion serves to illustrate the number of conditions in which a proper waiting period has reduced the mortality and improved the end result.

Acute hematogenous osteomyelitis was for a long time regarded as an emergency demanding immediate operation, but within recent years an increasing number of surgeons have apparently come to the conclusion independently that delay in this condition need not result in death or multiple bone involvement. The impetus for this change in attitude comes from contrasting the surprisingly good results in cases with late or no operation with those in

which early diagnosis and immediate operation occurred. Despite the difficulties of evaluating purely clinical data a study of a long series of cases in any hospital will probably reveal the same facts.<sup>1, 2, 3</sup>

Wilson and McKeever<sup>1</sup> in a paper recently read before the American Orthopaedic Association showed in their series a 25 per cent mortality in early operations and only 8.5 per cent in cases of late operation or spontaneous drainage. In the discussion which followed the paper most of the men taking part agreed that supportive measures were of more value than surgery. Even more striking figures are given for infants under 6 months by Green and Shannon<sup>2</sup> at the Children's Hospital where an operative mortality of 45 per cent was reduced to practically nil by not operating except to drain soft part or subperiosteal abscesses. These authors recognize a difference in the nature of the condition in young children, but the principles of treatment would seem to be equally applicable to older individuals.

The advances in our knowledge of immunity to staphylococci made in the last five years add considerable weight to the rationale of conservatism. It has been demonstrated that the staphylococcus produces a potent exotoxin which causes necrosis, hemolysis and death. Antitoxins have been produced and administered to patients with acute osteomyelitis with apparently excellent results. It is, of course, too early to evaluate properly the reports already published,<sup>3</sup> but one can at least form the judgment that the delay occasioned while the patient is being treated with antitoxin does not increase mortality.

It should be stressed that hematogenous osteomyelitis begins as a staphylococcus septicemia and that the localized bone lesion is only one manifestation of a systemic disease. In the most severe cases death may ensue despite all medical efforts, but inopportune surgery can only serve to hasten the demise of the patient.

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## ANNUAL REPORT OF THE MASSACHUSETTS GENERAL HOSPITAL

THE Report of the Trustees of the Massachusetts General Hospital for the year 1935 reflects the tendency of the country at large to pull out of the depression. Outpatient visits decreased by 12,000, Phillips House patients

numbered 1782 (the highest number since 1930), Baker patients totaled 4805, an increase of almost 400 over the previous year. In the General Hospital itself the year 1935 compared with 1934 as follows

	Average Patients per Day	
	1935	1934
Pay patients	70—	56—
Patients paying something	127+	127+
Free patients	178+	189+

No important changes in the plant have taken place. Numerous minor improvements and repairs have been made among which may be noted the setting out of some twenty-three trees on the hospital grounds. The closing in of the corridor between the Phillips House and the Baker Memorial has been a great improvement.

Events of interest to friends of the hospital were the award of the Warren Triennial Prize to Dr Norman E. Freeman for his essay entitled "The Physiology of Gangrene," the participation of the Hospital in the foundation of the Boston Hospital Council composed of twenty-three hospitals of the Metropolitan district and the affiliation of the Hospital with the Community Federation of Boston.

Among the Staff changes which took place in 1935 were the resignation of Dr. Beth Vincent as Chief of the East Surgical Service and the appointment of Dr. Arlie V. Bock as Henry K. Oliver Professor of Hygiene at Harvard University. Doctor Bock continues to have a tour of duty as Visiting Physician on the Medical Wards. Three members of the Staff died during the year—Dr. Edward W. Karcher, Dr. D. Campbell Smith and Dr. John Bryant. The tragic death of Dr. George H. Bigelow, which was not confirmed until his body was found on March 3, 1935, was a personal loss to everybody connected with the hospital. The hospital was fortunate in being able to secure as Director Dr. Nathaniel W. Faxon, formerly Director of the Strong Memorial Hospital of Rochester, New York, who assumed the management of the hospital on July 1, 1935.

As with other enterprises, a hospital must continue to grow if it would avoid slipping backward. The Massachusetts General Hospital in the opinion of the General Executive Committee is large enough as it is, further growth should be directed toward improving the standards of the hospital. Among the most pressing needs are a new nurses' home, an endowment for the Nurses' Training School and funds available for purposes of research. The policy that should govern future development is expressed in the last paragraph of the Report of the General Executive Committee.

"A broader vision of the function of the hospital makes it no longer possible to outline a

budget based on the old familiar estimate of the daily cost per patient. Such standards are applicable only in municipal or governmental institutions responsible to the taxpayers for the economic care of the sick. Private institutions must face in addition to the actual care of patients the equally important fields of professional education and clinical investigation. Above all the hospital in its clinical and scientific efforts must establish and maintain the highest standards of excellence."

## POSTGRADUATE INSTRUCTION BY THE MASSACHUSETTS MEDICAL SOCIETY

THE Fellows of the Massachusetts Medical Society are again offered the opportunity of having postgraduate extension instruction brought to them through the efforts of the state committee on postgraduate instruction. On page 592 of this issue are presented the programs of the districts which begin their courses in the near future. The subject matter is timely and should be of personal interest to every practicing physician. The committee arranged the curriculum last spring and the faculty have given much thought to the programs in order to make the instruction of practical value. The faculty chairmen in charge of the various courses are well-known educators. Every Fellow of the Massachusetts Medical Society should take an active interest in making the postgraduate extension courses a real success.

## THIS WEEK'S ISSUE

CONTAINS articles by the following named authors

PALMER ROBERT STERLING A.B., M.D. Harvard University Medical School 1925. Instructor in Medicine Harvard University Medical School. Assistant in Medicine Massachusetts General Hospital. His subject is The Efficacy of Medical Treatment in Essential Hypertension. Page 569. Address 330 Dartmouth Street Boston Mass.

SHAW NORMAN D. M.D. University of Michigan Homeopathic Medical School 1916. Staff Member of the Public Health Institute. Address Public Health Institute, 159 North Dearborn Street, Chicago, Ill. Associated with him is

BRUNET WALTER M. M.D. Medical College of Virginia 1911. Chief of Staff and Director of Urological Division, Public Health Institute. Address Public Health Institute, 159 North Dearborn Street Chicago, Ill. Their subject is Nonspecific Urethritis. Its Causes Differential Diagnosis Examination Routine and Treatment. Page 572.

KING, GEORGE C M D Tufts College Medical School 1909 Pediatrician, Truesdale Hospital Address Truesdale Hospital, Fall River Mass Associated with him is

HAWES CORNELIUS H M D Harvard University Medical School 1929 Assistant Surgeon, Truesdale Hospital Address Truesdale Hospital, Fall River, Mass Then subject is Ruptured Ovarian Cyst in Childhood Report of a Case Page 576

DOWNING, JOHN GODWIN A B, M D Harvard University Medical School 1915 Assistant Professor of Dermatology, Tufts College Medical School Dermatologist, Beth Israel Hospital, St Elizabeth's Hospital and the Boston City Hospital His subject is The Legal Aspects of Industrial Dermatoses Page 577 Address 520 Commonwealth Avenue, Boston, Mass

PHELPS, FRANK C M D University of Vermont College of Medicine 1893 Preceptor, Extramural Service Medical Department, University of Vermont College of Medicine Attending Physician, Vermont State Industrial School and Porter Hospital His subject is My Personal Experience with the Extramural Service Page 580 Address Vergennes, Vt

### The Massachusetts Medical Society

#### FOURTH ANNUAL POSTGRADUATE EXTENSION COURSE

FALL, 1936

The Massachusetts Medical Society Committee on Postgraduate Instruction presents the following programs in the various districts

Frank R Ober Chairman  
Leroy E Parkins Secretary

#### Faculty Chairmen of Courses

Acute Abdominal Emergencies—Howard M Clute  
Anesthesia—Sidney C Wiggin  
Arthritis—Frank R Ober  
Blood Diseases—William P Murphy  
Cancer—Robert B Greenough  
Dermatology and Syphilis—E Lawrence Oliver  
Diabetes—Elliott P Joslin  
Heart Disease—Paul D White  
Lung Disease—Frederick T Lord  
Neurological Surgery—Donald Munro  
Psychiatry—Harry C Solomon  
Stomach and Duodenal Ulcer—Chester M Jones

#### BARNSTABLE DISTRICT

##### Postgraduate Extension Curriculum

October 18

Arthritis (One Session)  
Diagnosis and Treatment Instructor—J S Barr

October 25

##### Blood Diseases (Two Sessions)

Session 1 The Hemoglobin and Red Blood Cells in Relation to Disease Instructor—W B Castle

November 1

Session 2 Diseases Affecting the White Blood Cells Leukemias Agranulocytosis Mononucleosis Instructor—Henry Jackson Jr

November 8

##### Heart Disease (Two Sessions)

Session 1 Treatment of Cardiovascular Emergencies Instructor—B E Hamilton

November 15

Session 2 The Prognosis of Heart Disease. Instructor—R S Palmer

November 22

##### Acute Abdominal Emergencies (One Session)

Instructor—H M Clute

The course will be given at the Cape Cod Hospital, Hyannis on Sundays at 1 p m

JOHN I B VAIL, M D,

District Chairman, Postgraduate Instruction

#### BERKSHIRE DISTRICT

##### Postgraduate Extension Curriculum

October 8

##### Blood Diseases (One Session)

Diseases Affecting the White Blood Cells Leukemias Agranulocytosis Mononucleosis Instructor—Henry Jackson Jr

October 15

##### Diabetes (One Session)

Complications of Diabetes and Their Treatment Coma Insulin Reactions Surgery (Gangrene, Carbuncle Etc) Marriage and Pregnancy Tuberculosis and Heart Disease Instructor—Alexander Marble

October 22

##### Neurological Surgery (One Session)

The Signs and Symptoms of the Common Brain Lesions—Organic and Traumatic Instructor—J S Hodgson

October 29

##### Stomach and Duodenal Ulcer (One Session)

Diagnosis and Treatment Instructor—T V Urmey

November 5

##### Cancer (One Session)

Cancer of the Cervix Fundus and Ovary Instructor—G A Leland, Jr

November 12

Acute Abdominal Emergencies (One Session)

Instructor—R R Linton

The course will be given at the House of Mercy Hospital Pittsfield on Thursdays at 4 30 p m

MELVIN H WALKER JR MD

District Chairman, Postgraduate Instruction

BRISTOL NORTH DISTRICT

Postgraduate Extension Curriculum

November 5

Acute Abdominal Emergencies (One Session)

Instructor—E L Young Jr

November 12

Anesthesia (One Session)

(a) Drugs in Anesthesia

(b) General Care of Patient in Anesthesia

Instructor—P D Woodbridge

November 19

Diabetes (Two Sessions)

Session 1 General Plan of Treatment in Uncomplicated Cases Diet Insulin (Regular and Protamine) Exercise Instructor—E P Joslin

December 3

Session 2 Complications of Diabetes and Their Treatment Coma Insulin Reactions Surgery (Gangrene Carbuncle Etc) Marriage and Pregnancy Tuberculosis and Heart Disease Instructor—E P Joslin

December 10

Heart Disease (Two Sessions)

Session 1 Treatment of Cardiovascular Emergencies Instructor—W D Reid

December 17

Session 2 The Prognosis of Heart Disease Instructor—Ashton Gravelle

The course will be given at the Morton Hospital Taunton on Thursdays at 4 p m

ARTHUR R CRANDELL, M.D.,

District Chairman Postgraduate Instruction

ESSEX SOUTH DISTRICT

Postgraduate Extension Curriculum

October 13

Anesthesia (One Session)

(a) Drugs in Anesthesia

(b) General Care of Patient in Anesthesia

Instructor—S C Wiggin

October 20

Diabetes (Two Sessions)

Session 1 General Plan of Treatment in Uncomplicated Cases Diet Insulin (Regular and Protamine) Exercise Instructor—Reginald Fitz

October 27

Session 2 Complications of Diabetes and Their Treatment Coma Insulin Reactions Surgery (Gangrene Carbuncle Etc) Marriage and Pregnancy Tuberculosis and Heart Disease Instructor—Reginald Fitz

November 3

Blood Diseases (Two Sessions)

Session 1 The Hemoglobin and Red Blood Cells in Relation to Disease Instructor—W P Murphy

November 10

Session 2 Diseases Affecting the White Blood Cells Leukemias Agranulocytosis Mononucleosis Instructor—G S FitzHugh

November 17

Acute Abdominal Emergencies (One Session)

Instructor—H B Loder

The course will be given at the Salem Hospital Salem on Tuesdays at 4 p m

WALTER G PHIPPEN MD

District Chairman Postgraduate Instruction

FRANKLIN DISTRICT

Postgraduate Extension Curriculum

October 14

Blood Diseases (Two Sessions)

Session 1 The Hemoglobin and Red Blood Cells in Relation to Disease Instructor—C W Heath

October 21

Cancer (One Session)

Cancer of the Genito-Urinary Tract Instructor—J D Barney

October 25

Blood Diseases

Session 2 Diseases Affecting the White Blood Cells Leukemias Agranulocytosis Mononucleosis Instructor—W P Murphy

November 4

Anesthesia (One Session)

(a) Drugs in Anesthesia

(b) General Care of Patient in Anesthesia

Instructor—Joseph Tartakoff



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Heart Disease—Paul D White  
Lung Disease—Frederick T Lord  
Neurological Surgery—Donald Munro  
Psychiatry—Harry C Solomon  
Stomach and Duodenal Ulcer—Chester M Jones

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Diagnosis and Treatment Instructor—J S Barr

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November 1

Session 2 Diseases Affecting the White Blood Cells Leukemias Agranulocytosis Mononucleosis Instructor—Henry Jackson Jr

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Heart Disease (Two Sessions)

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November 15

Session 2 The Prognosis of Heart Disease Instructor—R S Palmer

November 22

Acute Abdominal Emergencies (One Session)

Instructor—H M Clute

The course will be given at the Cape Cod Hospital, Hyannis on Sundays at 4 p m

JOHN I B VAIL, M.D.,

District Chairman, Postgraduate Instruction

#### BERKSHIRE DISTRICT

##### Postgraduate Extension Curriculum

October 8

Blood Diseases (One Session)

Diseases Affecting the White Blood Cells Leukemias Agranulocytosis Mononucleosis Instructor—Henry Jackson Jr

October 15

Diabetes (One Session)

Complications of Diabetes and Their Treatment Coma Insulin Reactions Surgery (Gangrene Carbuncle Etc.) Marriage and Pregnancy Tuberculosis and Heart Disease Instructor—Alexander Marble

October 22

Neurological Surgery (One Session)

The Signs and Symptoms of the Common Brain Lesions—Organic and Traumatic Instructor—J S Hodgson

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Stomach and Duodenal Ulcer (One Session)

Diagnosis and Treatment Instructor—T V Urmey

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Cancer (One Session)

Cancer of the Cervix Fundus and Ovary Instructor—G A Leland, Jr

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Neurological Surgery (One Session)

The Signs and Symptoms of the Common Brain Lesions—Organic and Traumatic Instructor—W R Wegner

October 27

Anesthesia (One Session)

- (a) Drugs in Anesthesia
- (b) General Care of Patient in Anesthesia

Instructor—P D Woodbridge

November 3

Blood Diseases (Two Sessions)

Session 1 The Hemoglobin and Red Blood Cells in Relation to Disease Instructor—G S FitzHugh

November 10

Session 2 Diseases Affecting the White Blood Cells Leukemias Agranulocytosis Mononucleosis Instructor—C S Keefer

The course will be given at the Melrose Hospital Melrose on Tuesdays at 4 p m except the session on Acute Abdominal Emergencies which will be held on Wednesday October 7 at the Bear Hill Golf Club Stoneham at 1 30 p m

JOSEPH H FAY M.D.

*District Chairman Postgraduate Instruction*

#### MIDDLESEX SOUTH DISTRICT

Postgraduate Extension Curriculum

October 27

Dermatology and Syphilis (One Session)

- (a) Common Skin Diseases
- (b) Diagnosis and Treatment of Early Syphilis

Instructor—E L Oliver

November 3

Heart Disease (Two Sessions)

Session 1 The Prognosis of Heart Disease Instructor—P D White

November 10

Session 2 Treatment of Cardiovascular Emergencies Instructor—H B Sprague

November 17

Stomach and Duodenal Ulcer (One Session)

Diagnosis and Treatment Instructor—C M Jones

November 24

Anesthesia (One Session)

- (a) Drugs in Anesthesia
- (b) General Care of Patient in Anesthesia

Instructor—Joseph Tartakoff

December 1

Acute Abdominal Emergencies (One Session)

Instructor—A W Allen

The course will be given at the Cambridge Municipal Hospital Cambridge on Tuesdays at 4 00 p m

EDMUND H ROBBINS M.D.

*District Chairman Postgraduate Instruction*

#### NORFOLK DISTRICT

Postgraduate Extension Curriculum

October 16

Acute Abdominal Emergencies (One Session)

Instructor—H B Loder

October 23

Heart Disease (One Session)

Treatment of Cardiovascular Emergencies Instructor—B E Hamilton

October 30

Diabetes (Two Sessions)

Session 1 General Plan of Treatment in Uncomplicated Cases Diet Insulin (Regular and Protamine) Exercise Instructor—Alexander Marble

November 6

Session 2 Complications of Diabetes and Their Treatment Coma Insulin Reactions Surgery (Gangrene Carbuncle Etc) Marriage and Pregnancy Tuberculosis and Heart Disease Instructor—Alexander Marble

November 13

Blood Diseases (Two Sessions)

Session 1 Diseases Affecting the White Blood Cells Leukemias Agranulocytosis Mononucleosis Instructor—W B Castle

November 20

Session 2 The Hemoglobin and Red Blood Cells in Relation to Disease Instructor—G S FitzHugh

The course will be given at the Norwood Hospital Norwood on Fridays at 8 30 p m

HUGO B C RIEMER M.D.

*District Chairman Postgraduate Instruction*

#### WORCESTER DISTRICT (Milford Section)

Postgraduate Extension Curriculum

October 15

Acute Abdominal Emergencies (One Session)

Instructor—S J G Nowak

November 18

Neurological Surgery (One Session)

The Signs and Symptoms of the Common Brain  
Lesions—Organic and Traumatic Instructor  
—W R Wegner

November 25

Diabetes (One Session)

*Complications of Diabetes and Their Treatment*  
Coma Insulin Reactions Surgery (Gan-  
grene, Carbuncle Etc) Marriage and Preg-  
nancy Tuberculosis and Heart Disease In-  
structor—Priscilla White

The course will be given at the Franklin County  
Public Hospital, Greenfield on Wednesdays at 8 p m

HALBERT G STETSON M D,

District Chairman, Postgraduate Instruction

## HAMPSHIRE DISTRICT

## Postgraduate Extension Curriculum

October 8

Psychiatry (One Session)

- (a) Psychobiology in General Medicine
- (b) The Common Neuroses

Instructor—K J Tillotson

October 15

Diabetes (Two Sessions)

Session 1 General Plan of Treatment in *Un-  
complicated* Cases Diet Insulin (Regular  
and Protamine) Exercise Instructor—  
H F Root.

October 22

Session 2 *Complications of Diabetes and Their*  
Treatment Coma Insulin Reactions Sur-  
gery (Gangrene, Carbuncle Etc) Marriage  
and Pregnancy Tuberculosis and Heart Dis-  
ease Instructor—H F Root

October 29

Neurological Surgery (One Session)

The Signs and Symptoms of the Common Brain  
Lesions—Organic and Traumatic Instructor  
—Donald Munro

November 5

Anesthesia (One Session)

- (a) Drugs in Anesthesia
  - (b) General Care of Patient in Anesthesia
- Instructor—S C Wigglin

November 12

Obstetrics and Pediatrics (One Session)

General Consideration of Newer Aspects of Ob-  
stetrics and Pediatrics from the Viewpoint  
of the General Practitioner Instructors—  
M V Kapplus S H Clifford

The course will be given in Springfield on Thurs-  
days at 4 00 p m at the Academy of Medicine, Pro-  
fessional Building 20 Maple Street, and on the same  
day at 8 30 p m, in the Outpatient Department of  
the Skinner Clinic Holyoke Hospital Holyoke

GEORGE L SCHADT M D

GEORGE D HENDERSON M D,

District Chairmen Postgraduate Instruction

## HAMPSHIRE DISTRICT

## Postgraduate Extension Curriculum

October 7

Acute Abdominal Emergencies (One Session)

Instructor—H M Clute

October 14

Heart Disease (Two Sessions)

Session 1 Treatment of Cardiovascular Emer-  
gencies Instructor—C L Derick

October 21

Session 2 The Prognosis of Heart Disease In-  
structor—Sylvester McGinn

October 28

Stomach and Duodenal Ulcer (One Session)

Diagnosis and Treatment Instructor—E S  
Emery Jr

November 4

Blood Diseases (Two Sessions)

Session 1 The Hemoglobin and Red Blood Cells  
in Relation to Disease Instructor—C W  
Heath

November 18

Session 2 Diseases Affecting the White Blood  
Cells Leukemias Agranulocytosis, Mono-  
nucleosis Instructor—C S Keefer

The course will be given in the Nurses Home of  
the Cooley Dickinson Hospital Northampton on  
Wednesdays at 4 15 p m

ROBERT B BIGHAM M D

District Chairman Postgraduate Instruction

## MIDDLESEX EAST DISTRICT

## Postgraduate Extension Curriculum

October 7

Acute Abdominal Emergencies (One Session)

Instructor—E L Young Jr

October 13

Stomach and Duodenal Ulcer (One Session)

Diagnosis and Treatment Instructor—T V  
Urmey

October 20

Neurological Surgery (One Session)

The Signs and Symptoms of the Common Brain Lesions—Organic and Traumatic Instructor—W R Wegner

October 27

Anesthesia (One Session)

- (a) Drugs in Anesthesia
- (b) General Care of Patient in Anesthesia

Instructor—P D Woodbridge

November 3

Blood Diseases (Two Sessions)

Session 1 The Hemoglobin and Red Blood Cells in Relation to Disease Instructor—G S FitzHugh

November 10

Session 2 Diseases Affecting the White Blood Cells Leukemias Agranulocytosis Mononucleosis Instructor—C S Keefer

The course will be given at the Melrose Hospital Melrose on Tuesdays at 4 p m except the session on Acute Abdominal Emergencies which will be held on Wednesday October 7 at the Bear Hill Golf Club Stoneham at 1 30 p m

JOSEPH H FAY M.D

*District Chairman Postgraduate Instruction*

#### MIDDLESEX SOUTH DISTRICT

Postgraduate Extension Curriculum

October 27

Dermatology and Syphilis (One Session)

- (a) Common Skin Diseases
  - (b) Diagnosis and Treatment of Early Syphilis
- Instructor—E L Oliver

November 3

Heart Disease (Two Sessions)

Session 1 The Prognosis of Heart Disease Instructor—P D White

November 10

Session 2 Treatment of Cardiovascular Emergencies Instructor—H B Sprague

November 17

Stomach and Duodenal Ulcer (One Session)

Diagnosis and Treatment Instructor—C M Jones

November 24

Anesthesia (One Session)

- (a) Drugs in Anesthesia
  - (b) General Care of Patient in Anesthesia
- Instructor—Joseph Tartakoff

December 1

Acute Abdominal Emergencies (One Session)

Instructor—A W Allen

The course will be given at the Cambridge Municipal Hospital Cambridge on Tuesdays at 4 00 p m

EDMUND H ROBBINS M.D

*District Chairman Postgraduate Instruction*

#### NORFOLK DISTRICT

Postgraduate Extension Curriculum

October 16

Acute Abdominal Emergencies (One Session)

Instructor—H B Loder

October 23

Heart Disease (One Session)

Treatment of Cardiovascular Emergencies Instructor—B E Hamilton

October 30

Diabetes (Two Sessions)

Session 1 General Plan of Treatment in Uncomplicated Cases Diet Insulin (Regular and Protamine) Exercise Instructor—Alexander Marble

November 6

Session 2 Complications of Diabetes and Their Treatment Coma Insulin Reactions Surgery (Gangrene Carbuncle Etc) Marriage and Pregnancy Tuberculosis and Heart Disease Instructor—Alexander Marble

November 13

Blood Diseases (Two Sessions)

Session 1 Diseases Affecting the White Blood Cells Leukemias Agranulocytosis Mononucleosis Instructor—W B Castle

November 20

Session 2 The Hemoglobin and Red Blood Cells in Relation to Disease Instructor—G S FitzHugh

The course will be given at the Norwood Hospital, Norwood on Fridays at 8 30 p m

HUGO B C RIEMER M.D

*District Chairman Postgraduate Instruction*

#### WORCESTER DISTRICT (Milford Section)

Postgraduate Extension Curriculum

October 15

Acute Abdominal Emergencies (One Session)

Instructor—S J G Nowak

November 18

## Neurological Surgery (One Session)

The Signs and Symptoms of the Common Brain Lesions—Organic and Traumatic Instructor—W R Wegner

November 25

## Diabetes (One Session)

Complications of Diabetes and Their Treatment Coma Insulin Reactions Surgery (Gangrene, Carbuncle, Etc) Marriage and Pregnancy Tuberculosis and Heart Disease Instructor—Priscilla White

The course will be given at the Franklin County Public Hospital Greenfield on Wednesdays at 8 p m

HALBERT G STETSON MD

District Chairman Postgraduate Instruction

## HAMPSHIRE DISTRICT

## Postgraduate Extension Curriculum

October 8

## Psychiatry (One Session)

- (a) Psychobiology in General Medicine
- (b) The Common Neuroses

Instructor—K J Tiliotson

October 15

## Diabetes (Two Sessions)

Session 1 General Plan of Treatment in Uncomplicated Cases Diet Insulin (Regular and Protamine) Exercise Instructor—H F Root

October 22

Session 2 Complications of Diabetes and Their Treatment Coma Insulin Reactions Surgery (Gangrene Carbuncle, Etc) Marriage and Pregnancy Tuberculosis and Heart Disease Instructor—H F Root

October 29

## Neurological Surgery (One Session)

The Signs and Symptoms of the Common Brain Lesions—Organic and Traumatic Instructor—Donald Munro

November 5

## Anesthesia (One Session)

- (a) Drugs in Anesthesia
  - (b) General Care of Patient in Anesthesia
- Instructor—S C Wiggin

November 12

## Obstetrics and Pediatrics (One Session)

General Consideration of Newer Aspects of Obstetrics and Pediatrics from the Viewpoint of the General Practitioner Instructors—M V Kapplus S H Clifford

The course will be given in Springfield on Thursdays at 4 00 p m at the Academy of Medicine, Professional Building 20 Maple Street and on the same day at 8 30 p m in the Outpatient Department of the Skinner Clinic, Holyoke Hospital Holyoke

GEORGE L SCHWART MD,

GEORGE D HENDERSON MD

District Chairmen, Postgraduate Instruction

## HAMPSHIRE DISTRICT

## Postgraduate Extension Curriculum

October 7

## Acute Abdominal Emergencies (One Session)

Instructor—H M Clute

October 14

## Heart Disease (Two Sessions)

Session 1 Treatment of Cardiovascular Emergencies Instructor—C L Derick

October 21

Session 2 The Prognosis of Heart Disease Instructor—Sylvester McGinn

October 28

## Stomach and Duodenal Ulcer (One Session)

Diagnosis and Treatment Instructor—E S Emery Jr

November 4

## Blood Diseases (Two Sessions)

Session 1 The Hemoglobin and Red Blood Cells in Relation to Disease Instructor—C W Heath

November 18

Session 2 Diseases Affecting the White Blood Cells Leukemias Agranulocytosis Mononucleosis Instructor—C S Keefer

The course will be given in the Nurses Home of the Cooley Dickinson Hospital Northampton on Wednesdays at 4 15 p m

ROBERT B BRIGHAM MD

District Chairman Postgraduate Instruction

## MIDDLESEX EAST DISTRICT

## Postgraduate Extension Curriculum

October 7

## Acute Abdominal Emergencies (One Session)

Instructor—E L Young Jr

October 13

## Stomach and Duodenal Ulcer (One Session)

Diagnosis and Treatment Instructor—T V Urmey

mothers and children are administered by the Children's Bureau of the U S Department of Labor those for extension of public health services are administered by the U S Public Health Service and the provisions for vocational rehabilitation are administered by the Office of Education in the Interior Department

#### EXPLANATION OF PROVISIONS FOR AID TO DEPENDENT CHILDREN

The Social Security Act does not permit the Federal Government to make any direct payment for the aid of dependent children. Instead it provides for Federal grants to states so that they may give financial assistance for the care of dependent children living with relatives.

A dependent child as defined in the Social Security Act is one under the age of 16 years who has been deprived of parental support or care by reason of the death, continued absence from the home or physical or mental incapacity of a parent and who is living in the home of a relative specified in the Act.

When a state provides a system of aid to needy dependent children which is in conformity with the Social Security Act, the Federal Government will pay to the state an amount equal to one-third of the total sum expended by the state under such plan up to \$18 per month for one dependent child and \$12 per month for each of the other dependent children in the same home. The state may expend more than these amounts but Federal funds will not be granted for such additional assistance.

If there is no provision for aid to needy dependent children in a state or if the present state law is not in conformity with the Federal Social Security Act it will be necessary for that state to enact appropriate legislation or take other legal steps in order to obtain Federal aid.

The family desiring assistance for needy dependent children under 16 years of age should apply to the public welfare agency nearest their residence. If there is no public welfare agency in the local community the family should write to the State Department of Public Welfare or the State Relief Administration at the State Capitol.

#### NEW METHOD OF DISSEMINATING AND COORDINATING THE MEDICAL STUDIES OF ALL NATIONS\*

Our propositions are as follows:

- 1 We supply to publications and periodicals of the art of medicine all references and information which are required and reply to all questions as quickly as possible.
- 2 We endeavor to assist publishers in disseminating their literature among the public employing medical journals and proceedings pertaining to studies of similar nature.

A translation of the original which was in Latin

- 3 We undertake to assist writers of medical works to have their writings published in the medical journals and periodicals of any nation that they may be circulated far and wide.
- 4 We inform physicians and pharmacists of every thing useful which may be employed in their professional activities and of the price of such articles. We send them requested samples and inform them how their commodities may be applied to the medical activities of any nation.
- 5 We gladly assist those who are in charge of international medical conventions both in arranging congresses and in disseminating their proceedings and resolutions.

International Centre of Medical Alliance  
3348 Casella Postale  
Milan, Italy

#### RHODE ISLAND FREES ITS CATTLE OF TUBERCULOSIS

The State of Rhode Island has been designated a modified accredited area signifying the practical eradication of bovine tuberculosis. The U S Department of Agriculture announces. The recognition of Newport County as a modified accredited area placed all the counties in Rhode Island in that status. The term is used by Department and State veterinary officials to designate areas in which there is less than one-half of 1 per cent of tuberculosis among cattle as shown by official testing. All reactors to the tests must also be removed and precautions taken to prevent reinfection of the area.

With Rhode Island there are now 41 States listed as modified accredited areas in addition to the District of Columbia. Tuberculosis-eradication work in Rhode Island was undertaken about 20 years ago but the extent of this activity was greatly increased during the last 5 years. Tuberculosis in cattle formerly existed in that State to a considerable degree making it a difficult undertaking to reduce the infection to less than one-half of 1 per cent. Results of the retesting of herds in the State have been very encouraging in showing the effectiveness of the eradication campaign.

Officials of the Bureau of Animal Industry, U S Department of Agriculture report excellent cooperation from herd owners and State and county authorities who participate in the achievement.

#### SERODIAGNOSTIC TESTS IN LEPROSY

In 1934 the Surgeon General of the United States Public Health Service appointed a committee to evaluate the various tests employed in the serodiagnosis of syphilis. The comments of this committee appear in the *Bulletin of the United States Treasury Department* September 1936 No. 9 of Volume 17 and are as follows:

- 1 A total of 59.5 per cent of the serologic reactions from leprosy patients were positive. The complement fixation tests showed 53 per cent positive and the flocculation tests showed 62.4 per cent positive.

It is possible that in certain States for which figures are not yet available, contrary trends may have prevailed. But considering the general uniformity of the findings in the 18 States for which the figures are at hand it seems hardly likely that such divergencies, if they exist at all, are anything more than exceptions to the general rule. The 18 States here discussed form a very fair cross section of the country as a whole. They are so distributed that they represent all but three of the important geographic sections. The outstanding exception is the area covered by the Middle Atlantic States, the others are the West South Central and the Mountain States. Respecting the last named it is especially to be regretted that we lack the figures for Nevada, since the divorce statistics of that State normally act as a barometer of the divorce situation throughout the country as a whole—*Bulletin, Metropolitan Life Insurance Company, August 1936*

#### BENEFITS AND PUBLIC SERVICES CREATED BY THE SOCIAL SECURITY ACT

Massachusetts citizens are eligible for nine of the ten separate benefits. These benefits and services are the following: assistance to the needy aged; aid to the needy blind; unemployment compensation, maternal and child health services; services for crippled children, child welfare services; vocational rehabilitation; public health services, and Federal old age benefits (to begin in 1937).

The State is not participating in aid to dependent children in their own homes.

A summary of the benefits has been made public by the Board in connection with the first anniversary of the Social Security Act, which became a law in August 1935. This summary indicates that more than \$2,760,000 in allowances for public assistance to the needy aged and to the needy blind and \$159,513 for administration of its unemployment compensation law have already gone to Massachusetts from the Social Security Board. In addition, the Commonwealth has received \$69,674, for services to mothers and children from the Children's Bureau of the Department of Labor and smaller, but substantial sums have been received from the Federal departments administering other provisions of the Act.

The funds granted Massachusetts for administration of its unemployment compensation law are paying all proper costs of establishing a system which will afford protection to 936,563 employees of 15,000 employers when benefits become payable. Furthermore, employers of the Commonwealth are entitled to deduct from the Federal tax on employers of eight or more created by the Act—to the extent of 90 per cent of that tax—the amount of their contributions to the State unemployment compensation fund with respect to employment as defined for the purposes of the Federal tax.

The allowances made to Massachusetts for assistance to the needy aged and to the blind matched

by funds provided by the State itself have made possible aid to more than 30,380 persons.

At the request of the Social Security Board the United States Treasury has sent to Massachusetts \$2,712,109 for assistance to the aged and \$50,452 for assistance to the blind.

This has enabled the Commonwealth to render assistance to 29,300 men and women over 70 years of age and to care for 1,089 needy blind persons. A recently enacted amendment to the Massachusetts old age assistance law reducing the age limit from 70 to 65 years, will go into effect in September.

It was pointed out at the Social Security Board that with the aid of Federal funds Massachusetts has been able to aid 40 per cent more of its needy aged this year than in 1934, the year before the passage of the Social Security Act.

This more adequate aid to those in distress in Massachusetts is made possible by the fact that, under the Social Security Act, the Federal Government not only pays a large proportion of the cost of administering public assistance in those States whose plans conform to the Social Security Act, but also gives such States allowances in advance for each quarter year to cover one-half their expected expenditures for aid to the aged and aid to the blind.

The Board makes such allowances to a State only where there is assurance

- (a) that the public assistance plan is in operation in all parts of the State, and if administered by political subdivisions is mandatory upon them
- (b) that there is financial participation by the State (so that the entire local burden is not thrown on counties),
- (c) that the plan is either administered by or supervised by a single State agency
- (d) that any person whose application for aid is denied an opportunity for a fair hearing before the State agency
- (e) that the plan provides for efficient methods of administration and
- (f) that the citizenship, residence, and age requirements do not exceed those allowed by the Federal Act

All of these conditions are met by the two public assistance plans of Massachusetts. Should the State plan for aid to dependent children meet these requirements, the Commonwealth would then be eligible to receive from the Social Security Board one-third of its expenditures for this form of assistance.

The provisions of the Social Security Act which set up these benefits—public assistance to the aged to the blind and to dependent children and unemployment compensation—are administered by the Social Security Board which has established a regional office at Boston to serve the States of Massachusetts, Connecticut, Maine, New Hampshire, Rhode Island and Vermont.

The provisions of the Act relating to services for



nurses and others to do medical work and work together for the good of humanity

Yours truly

FRANK E ROWE M D

61 Pleasant Street  
Revere, Massachusetts

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## RECENT DEATH

SULLIVAN—MARTIN GEORGE SULLIVAN M D of 197 Central Street Winchendon Massachusetts, died at his home September 14 1936 after a short illness

Dr Sullivan was born in Leominster Massachusetts in 1879 His premedical education was acquired at Ottawa University He graduated from the College of Physicians and Surgeons of Baltimore in 1903 and soon afterward settled in Winchendon where he subsequently practiced He joined the Massachusetts Medical Society in 1909 and was a member of Winchendon Council K of C

He is survived by his widow Mrs Mary V (Hoban) Sullivan

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## NOTICES

### LAWRENCE CANCER CLINIC

Established April 17 1928

Lawrence Mass

September 16, 1936

To the Physicians of the North Half of Essex County

Dear Doctor

The regular Lawrence Cancer Clinic to be held at Lawrence General Hospital 1 Garden Street Lawrence upon Tuesday October 6 at 10 00 a. m will be a Demonstration Clinic with Channing C Simmons M.D of Boston Associate in Surgery in the Graduate Courses in Medicine at Harvard University Medical School Surgeon in Chief to Collis P Huntington Memorial Hospital member of the Cancer Commission of Harvard University Boston and Visiting Surgeon to the Massachusetts General Hospital present as consultant You are invited to accompany any of your patients whom you desire shall have this service or to send them with a note and a report will be returned to you The service is gratis Your attendance at the Clinic is always welcome

This clinic is endorsed by the Committee on Post graduate Instruction of the Massachusetts Medical Society

#### COMMITTEE

ROY V Baketel M D  
Chas J Burgess M D  
John J McArdle, M D  
Harry H Nevers M D  
Thos V Uniacke M D  
J Forrest Burnham M D Chairman.

### FITCHBURG CANCER CLINIC

There will be a consultation clinic September 29 at the Burbank Hospital 9 30 a m to 12 m The consultant will be Dr Grantley W Taylor visiting surgeon to the Massachusetts General the Pondville and the Huntington Hospitals

Hope has been expressed that doctors will take advantage of this opportunity to be present with or refer by note any of their patients having cancer or suspicious of a malignant condition

In order to facilitate the clinical routine the patients arrival at 9 30 o'clock would be appreciated In other consultation clinics it has proved of value to have available any history regarding the patients condition

Please notify Miss Holmes clinic clerk Tel 1584 Out Patient Department Burbank Hospital any morning and supply specific information about the patients Luncheon will be served at 12 o'clock.

Active participation of the doctors will be appreciated

#### FITCHBURG CANCER COMMITTEE

F H Thompson Sr M D Chairman  
Walter F Sawyer M D Secretary  
Hervey B Pitcher M D  
Erskine R Pickwick M D  
Luigi V DeCicco M D  
Rudolf F Bachmann M D  
Frederick J Djerf M D

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## NOTICES OF MEETINGS

### FAULKNER HOSPITAL

#### CLINICAL MEETING

Throughout the coming winter on the first Thursday afternoon of each month at five o'clock there will be a clinical meeting of one hour's duration at the hospital At this meeting a clinical pathologic discussion about any interesting cases that have come to autopsy will be held and in addition a short talk on some topic of particular interest will be given by some one qualified to present the subject

The first meeting will be held on Thursday afternoon October 1 at 5 00 p m In addition to the clinical pathologic discussion Dr Burton E Hamilton will talk on The Treatment of Bacterial Endocarditis

This meeting is open to all physicians who are interested

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### ACADEMY OF PHYSICAL MEDICINE

The Academy of Physical Medicine will hold its Annual Meeting in Boston at the Hotel Statler on October 20 21 and 22 1936

The Program is educational in character and contains symposia and reports on the newer studies and clinical developments in the field of Physical Medicine presented by some of the foremost authorities in this branch of medical and surgical practice

2 The percentage of positive tests is some what higher among patients with advanced leprosy or in those showing numerous organisms in the lesions

3 It is still impossible to say whether the anesthetic nodular, or the mixed form of leprosy yields the highest percentage of positive reactions

4 There is a marked discrepancy in the results obtained with comparable specimens of blood sent to various serologists

5 Up to the present time no evidence has accumulated to indicate that a disease caused by an acid fast bacillus will give positive flocculation or complement fixation reactions for syphilis. It would seem logical to suggest that the entire question of the etiology of leprosy is in need of reinvestigation

6 It seems apparent that yaws is not the cause of many positive serologic reactions for syphilis among lepers in the United States

## CORRESPONDENCE

### THE CERTIFICATION OF SPECIALISTS

September 12, 1936

*Editor, New England Journal of Medicine*

I would like to comment on your editorial entitled 'The Certification of Specialists'. Medical requirements have been greatly increased during the past twenty five or thirty years. All of the states with the exception of two or three have passed excellent medical laws. The Colleges have raised their standards to a very high plane and the medical requirements are higher than in some European countries.

Doctors are registered to practice medicine in all the states in all branches and it would seem that the apparent tendency of lawmakers to protect the doctor might be well taken.

The lawyer is admitted to the bar to practice law in all its branches and the legal profession does not attempt in any way to regulate his practice, but is trying to improve the profession by other methods.

The great majority of the medical profession who have graduated within the past twenty five years have had a good college training and in addition have served as internes from one to three years, and I feel that it is safe for laymen to call them when sick. I do not think our standards have reached so low an ebb that certain members of the profession need take it upon themselves to warn the public against their colleagues.

Several years ago it was stated by an American Medical Association committee that 80 per cent of all medical work could be taken care of by the average man in general practice. If some members of the profession persist in trying to eliminate the general practitioner by minimizing his work to the laity and by influencing lay members of hospital

boards who in many cases know nothing about hospital or medical work, the public will rebel and the government may have to establish medical colleges in which to train doctors to take care of the people.

The general practitioner the backbone and life of the medical profession cannot be dispensed with. The profession would lose its high standing with the laity as it already has to a certain extent due in part to the unethical practices of some specialists.

I have been much interested in the study of health insurance schemes for many years and I am very much opposed to the proposition and in talking with laymen interested in establishing such a system I find they maintain that the increased cost of medical care in so far as the doctor is concerned is largely due to specialization. When it costs a poor man a large amount of money to be cared for by a specialist the profession loses some of its lustre in the mind of the patient and his friends.

It is becoming more evident every day that some of the special medical societies are interested only in their own members and not to any extent in the medical profession as a whole.

I do not mean to imply that specialists are not needed. They are, in a few branches of medicine. From time immemorial doctors have called their colleagues in consultation in serious cases. The welfare of the patient coming first, they will always continue to do so.

Great advances have been made in medicine new methods devised, new instruments invented and new operations in some branches. This new knowledge can be easily acquired by the majority of practitioners who have in most cases acquired their education in Class A colleges the same as a great many specialists.

As to the general practitioner not having the respect of specialists, that would be funny if it were not ridiculous. Many specialists have been made wealthy by the cases referred to them by the general practitioner. The practitioner is dealing with many branches of medicine and to be successful must acquire a great deal of general knowledge. The specialist on the other hand is supposed to be proficient in one branch. Concentrating on one branch he will necessarily neglect the other subjects so why the disrespect for the general practitioner? The practitioner has the legal right to specialize at any time and no special medical society can tell him where or how long he shall study. Most of them prefer general practice.

The various county and state medical societies and their journals are largely maintained by the dues of the general practitioner and in many states he holds office and has a part in the editing of the journal.

A house divided against itself shall fall. This is true also in the medical profession. If we are to maintain any semblance of being a united profession we must cut down specialization, stop teaching

Wednesday Afternoon and Evening May 12 1937—Annual Meeting Time and place for this meeting will be announced in an early spring issue of the Journal

ERWIN C MILLER M D Secretary

27 Elm Street Worcester

## BOOKS RECEIVED FOR REVIEW

The Endocrine Organs in Health and Disease with an Historical Review Sir Humphry Davy Rolleston 521 pp London Oxford University Press \$13 00

Squint Training M A Pugh 117 pp London Oxford University Press \$2 75

Clio Medica Edited by E B Krumbhaar XVII Gynecology and Obstetrics by Edwin M Jameson 170 pp New York Paul B Hoeber Inc \$2 00

Contraception as a Therapeutic Measure Bessie L Moses 106 pp Baltimore The Williams & Wilkins Company \$1 00

Tissue Immunity Renben L Kahn 707 pp Springfield and Baltimore Charles C Thomas \$7 50

Arthritis and Rheumatic Disease Maurice F Lautman 177 pp New York and London McGraw Hill Book Company, Inc \$2 00

Microbiology and Pathology for Nurses Charles F Carter 682 pp St Louis The C V Mosby Company \$3 00

An Introduction to Materia Medica and Pharmacology Hugh A. McGuigan and Edith P Brodie 580 pp St. Louis The C V Mosby Company \$2 75

A Diabetic Manual For Practitioners and Patients Edward L Bortz 222 pp Philadelphia F A Davis Co

A Roentgenographic Study of the Vascular Channels of the Skull With special reference to intracranial tumors and arterio venous aneurysms Knut Lindblom 146 pp Stockholm P A Norstedt & Söner Swed cr 10 —

Experimental Studies on a Transmissible Myelomatosis (Reticulosis) in Mice Otto Kaatiund Jorgensen 142 pp Copenhagen Levin & Munksgaard Swed cr 12 —

Morphologische und Tierexperimentelle Studien über das Schleimhautrelief des Magen Darmkanals Sten Grette 124 pp Stockholm P A Norstedt & Söner Swed cr 10 —

Chemical Procedures for Clinical Laboratories Marjorie R Mattice 520 pp Philadelphia Lea & Febiger \$6 50

## BOOK REVIEWS

Abortion Spontaneous and Induced Medical and Social Aspects Frederick J Tanssig 536 pp St. Louis The C V Mosby Company \$7 50

An active practitioner in high repute has written an encyclopedia of one integer of that divyus of medicine obstetrics and gynecology and incidentally The National Committee on Maternal Health

Inc , who sponsor this publication, and Robert L Dickinson its secretary have scored again Here is a volume which easily fits the glass slipper to the Cinderella of obstetrics miscarriage and, raises this lowly subject to the respectability which it deserves

The first 360 pages are medical and would more than fulfill the requirements of a medical encyclopedia on the subject. Then follow almost one hundred pages of sociology which call the physician's attention to the fact that his is a bigger job than treating the sick and that prevention of evil is more laudable than cure

The sociologist will find here an intensive study of the rôle which induced abortion places in the lay attempt to escape without legal medical assistance, the conflict between economics or worldliness and immutable sex physiology The author then expands his subject to include a description of how medicine and law have combined to assist some foreign peoples and even a proposal of how we in the United States could more accurately adjust our laws and practice of medicine to our mores which he infers include an easy willingness to get rid of the dangerous or even undesirable concepts

The fourth chapter describes the anatomy and physiology of early pregnancy with highly commendable simplicity, for it includes what most doctors remember as confounded embryology This the author presents in words and pictures which even the clinician can understand. The succeeding chapter on etiology is more detailed and inclusive than practically instructive for with naïve disregard for his own careful description of the relationship existing between the conceptus and the matrix and of the mechanism of abortion he faithfully records both lay and professional superstitions of cause of miscarriage and fails to bring home the fact that only 10 per cent of miscarriages can be attributed to the temporary concomitants so prominently mentioned and so long held responsible, while 90 per cent are due to intrinsic conceptional defects or to long standing abnormalities of maternal metabolism or endocrine balance

The author includes all this in his text The reviewer's soft criticism is that his erudition and instruction are somewhat ineffectively dispersed among pages of medical folklore For this day Dr Tanssig's discussions of treatment of abortion and of induction of abortion are also too charitably inclusive For an historical source book these chapters are excellent but the hurried surgeon might easily miss this experienced author's just and accurate appraisal of many methods which lie hidden between the lines

This book is a masterly comprehension of all phases of a very important factor in the happiness of individuals and the welfare of society It will be read with great profit not only by medical students and active practitioners of medicine but also by jurists sociologists theologians and please God, by some legislators

The three-day program will open with reports, surveys and presentations on fundamental subjects. Dr Frank Hammond Krusen of the Mayo Clinic will present the Presidential Address on "The Present Status of Physical Medicine." A fever therapy symposium is scheduled for the afternoon, preceded by an address by Dr Winfred Overholser, Commissioner of Mental Diseases. This will be followed in the evening by the Arthur H. Ring Foundation Lecture at Arlington to be delivered by Dr Stafford L. Warren on "Fundamental Principles Concerned in the Treatment of Gonococcus Infections by Artificial Fever Therapy." On the second day will be a symposium on Physical Education when the Academy will be addressed by Josephine Rathbone, Ph.D., Teachers College, Columbia University, Harold T. Edwards, A.A., of the Fatigue Laboratory, Harvard College and Dean Ernst Hermann Sargent College.

Papers on orthopedics will be presented by Dr Frederic Jay Cotton, Dr Fred H. Albee and Dr Gordon Morrison. Dr Abraham Myerson, Dr H. Houston Merritt and Dr Isador Coriat will present neurologic subjects. Dr Rebekah Wright will discuss Hydrotherapy technique.

On Thursday there will be a dermatologic symposium under the chairmanship of Dr Francis P. McCarthy in which Drs. Austin Cheever, C. Guy Lane, William Boardman, Francis M. Thurmon and Harvey P. Towle will participate. Papers on general subjects will be presented by leading internists. An electrosurgical symposium will be conducted by Dr Benedict F. Boland. Drs. William H. Schmidt, Lester R. Whitaker, Prodromos Papas will be heard in this group of presentations.

The Annual Banquet will take place on Wednesday evening, October 21 at the Hotel Statler.

A scientific exhibit and continuous motion pictures on subjects under discussion are included in the program.

All members of the medical profession are invited to attend.

A program will be mailed on request by writing to William D. McFee, M.D., Chairman of the Executive Committee, 41 Bay State Road, Boston, Massachusetts, or Franklin P. Lowry, M.D., Secretary, Treasurer, 313 Washington Street, Newton, Massachusetts.

### SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

#### CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, SEPTEMBER 28, 1936

Wednesday, September 30—  
112 m. Clinico-Pathological Conference Children's Hospital

Thursday, October 1—  
5 p m. Faulkner Hospital Clinical Meeting

Saturday, October 3—  
\*10 a m - 12 m. Staff Rounds at the Peter Bent Brigham Hospital. Conducted by Dr. Henry A. Christian

\*Open to the medical profession

†Open to Fellows of the Massachusetts Medical Society

September 29—Fitchburg Cancer Clinic. See page 601  
October 1—Taulkner Clinical Meeting. See page 601  
October 4-17—Medico-Military Inactive Duty Training, Mayo Foundation. See page 512. Issue of September 10.  
October 6—Lawrence Cancer Clinic. See page 601  
October 6 and 8—The Edward K. Dunham Lectureship Harvard Medical School Amphitheater Building C at 5 p m. See page 565. Issue of September 17.  
October 8—Pentucket Association of Physicians. Hotel Bartlett 95 Main Street Haverhill at 8 30 p m.  
October 12-16—Twenty-First International Assembly of the Inter-State Post-Graduate Medical Association. See pages 565 and 566. Issue of September 17.  
October 12-18—Third International Congress on Malaria. See page 1076. Issue of May 21.  
October 19-23—Clinical Congress of the American College of Surgeons. See page 180. Issue of January 23.  
October 19-31—1936 Graduate Fortnight of the New York Academy of Medicine. See page 1221. Issue of June 11.  
October 20-22—Academy of Physical Medicine Annual Meeting Hotel Statler Boston. See page 601.  
October 20-23—The American Public Health Association. See page 1226. Issue of June 11.  
November 16—One hundredth anniversary of the founding of the Army Medical Library 7th Street and Independence Avenue S.W. Washington, D.C.  
December 3-5—Annual Conference of the National Society for the Prevention of Blindness Columbus Ohio.  
March 30, April 2, 1937—First International Conference on Fever Therapy. Postponement notice. See page 52. Issue of July 2.  
April 21-24, 1937—American Society for Experimental Pathology. See page 1075. Issue of May 21.

### DISTRICT MEDICAL SOCIETIES

#### FRANKLIN DISTRICT MEDICAL SOCIETY

Will meet at the Weldon in Greenfield at 11 a. m. the second Tuesdays of November, January, March and May.  
CHARLES MOLINE, M.D., Secretary  
Sunderland

#### MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

October 7—Bear Hill Golf Club Stoneham.  
November 18—Bear Hill Golf Club Stoneham.  
January 13, 1937—Bear Hill Golf Club Stoneham.  
March 16, 1937—Danvers State Hospital Danvers.  
May 11, 1937—Bear Hill Golf Club Stoneham.

KENNETH L. MACLACHLAN, M.D., Secretary  
1 Bellevue Avenue Melrose

#### PLYMOUTH DISTRICT MEDICAL SOCIETY

October 15—11 a. m. at the Moore Hospital Brockton.  
FRED F. WEINER, M.D., Secretary  
231 Main Street Brockton.

#### WORCESTER DISTRICT MEDICAL SOCIETY

October 14—Rutland State Sanatorium, Rutland, Mass. 6 15 p m. Dinner—complimentary by the State Hospital. 7 30 p m. Business session and scientific program. Speakers and subjects to be announced in a later issue of the Journal.

November 5—At 4 30 in the rooms of the Worcester Medical Library Inc. at 34 Elm Street Worcester will be held the fall Censors meeting.

November 11—Grafton State Hospital North Grafton, Mass. 6 15 p m. Dinner—complimentary by the hospital. 7 30 p m. Business session and scientific program.

December 9—St. Vincent Hospital Worcester, Mass. 6 15 p m. Dinner—complimentary by the hospital. 7 30 p m. Business session and scientific program.

January 13, 1937—Worcester City Hospital Worcester, Mass. 6 15 p m. Dinner—complimentary by the hospital. 7 30 p m. Business session and scientific program.

February 10, 1937—Worcester State Hospital Worcester, Mass. 6 15 p m. Dinner—complimentary by the hospital. 7 30 p m. Business session and scientific program.

March 10, 1937—The Memorial Hospital Worcester, Mass. 6 15 p m. Dinner—complimentary by the hospital. 7 30 p m. Business session and scientific program.

April 14, 1937—Worcester Hahnemann Hospital Worcester, Mass. 6 15 p m. Dinner—complimentary by the hospital. 7 30 p m. Business session and scientific program.

May 6, 1937—At 4 30 in the rooms of the Worcester Medical Library Inc. at 34 Elm Street, Worcester will be held the spring meeting of the Board of Censors.



**American Martyrs to Science Through the Roentgen Rays.** Percy Brown 276 pp Springfield and Baltimore Charles C Thomas \$3 50

This little book of 276 pages contains brief biographies of the early workers with the x ray who died of injuries received as a result of their enthusiasm and energy. It also contains a most valuable chapter on how these injuries occurred, and a discussion of the effect of the x ray on tissue as understood at that time. The author, himself, was one of these early workers who regardless of the known dangers continued his work even after receiving severe injuries.

The twenty five men and one woman of whom he writes were all well known to him, some of them were very dear friends. Aside from its scientific and historical value the book is an eloquent tribute from a living martyr in the science of radiology to those who have already made the final sacrifice.

It should be read by every student of radiology and should be of interest to all who are concerned with the relief of suffering and disease.

**Adult Intelligence. A Psychological Study of Test Performances.** Theodore Welsenburg, Anne Roe, and Katharine E McBride 155 pp New York The Commonwealth Fund \$1 40

This is a book which should interest keenly a limited group — psychologists and psychiatrists whose work involves the competence of the feeble minded, the handicapped and the deteriorated. The book is a byproduct of the exhaustive and meticulously painstaking work of Dr Theodore H Welsenburg (it is hard to understand why this book is published using other than his usual name) in the field of aphasia. No one whose work and interests involve intelligence testing should fail to enlarge their critique by becoming familiar with this book.

**The Hair and Scalp. A Clinical Study.** Agnes Savill 288 pp Baltimore William Wood & Company \$5 00

This book is a refreshing account of hair conditions. The structure, physiology and hygiene are well discussed, and there is an interesting chapter on the molecular structure and elastic properties of hair. The details of waving and dyeing are reviewed. These elementary features are given considerable space. In discussing abnormal conditions the author has chosen to make chapter divisions on the basis of the chief symptoms complained of by the patient such as diffuse hairfall, scaly conditions, itching, pustular conditions, etc. The causes are reviewed and differentiated and the different diseases discussed in detail. The book deals essentially with common conditions and is a very practical one dealing of course with the English viewpoint and agents used by them. The photographs of individual hairs in various conditions are unique and unusually well done and the other illustrations of diseased conditions are excellent. High frequency

vacuum tubes are apparently used more than in this country and pastilles are still employed in the measurement of x ray dosage in contrast to American usage. The book also includes a short formulae.

**The Balanced Diet.** Logan Clendening 207 pp New York and London D Appleton Century Company \$1 50

The book is divided into several sections. In the first, the different essential components of food are described, in the second the food to consume at various ages and when afflicted with some of the common diseases as well as food fads and economics are discussed and in the last, tables of food values, and of weights, measures and equivalents are listed. These subjects are related in simple terms and an easy style of writing, and are made more readily understood by diagrammatic illustrations.

One picture which shows the conversion of starchy food into muscular energy makes the text especially clear, but in another the term "bony changes" used to describe the swelling of the wrists and ankles of a scorbutic infant is not very accurate.

On the whole the book is well adapted to its purpose and should be found interesting and valuable to many lay readers.

**A Study of Masturbation and the Psychosexual Life.** John F W Meagher Third Edition 149 pp Baltimore William Wood & Company \$2 00.

This treatise on masturbation is a thoroughly sound scientific treatment of the subject. The author lays a foundation for his discussion of the habit by tracing the development of the psychosexual side of the child's life and analyzing the various influences that affect it. The child's sexual growth is traced through its autoerotic narcissistic, homosexual and heterosexual stages.

As Dr Jelliffe says in his introduction this book is a simple and general discussion of the problem rather than a detailing of the latest psychoanalytic theories about masturbation. This book is intended for parents, teachers and religious instructors and we should say that it fulfills its purpose admirably.

**Sex and the Love Impulse. An Outspoken Guide to Happy Marriage.** J H Burns 61 pp New York Emerson Books Inc 50c

This little book is based on the theory that proper training in childhood and adolescence is the essential factor in the happy marriage. To that end almost two-thirds of it contains advice on the bringing up of children and on their sex education. It is, therefore, more a book for parents than it is for people about to be married. The author is a psychologist, specializing in children's work and has the theoretical rather than the technical point of view. The book is full of good common sense although at times this is rather obscured by some what fine writing.

